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MENTAL HYGIENE AND THE CONDITIONED REFLEX

By WILLIAM H. BURNHAM

In the human infant the immaturity of the nervous structure at birth and the long period of development which must elapse before functional maturity is attained, give especially favorable opportunity for education. This was long ago pointed out by the philosopher Anaximander and has been emphasized in modern times by John Fiske, President Butler, and others. Apparently, as has been suggested by Rubner, the vegetative functions predominate for a long period in the human infant in order to give a better opportunity for the development of the brain. The activity of the child at birth is controlled by the lower brain centers, the paleencephalon, or old brain; the neencephalon, or new brain, which began to appear in the evolutionary series with the lizards, and controls the higher mental processes, does not yet function.

The outstanding difference between the nervous mechanism of the child at birth and that of the adult is that the child is a paleencephalic organism. Its nervous mechanism responds to biologically adequate stimuli, but not to associative stimuli. The neencephalon, the special organ of association, is undeveloped. But, while the child is born without the use of this master organ of the human body, gradually after birth the higher functions of the brain are developed.

Thus in mental hygiene and the hygiene of school education we are concerned primarily with the normal development and hygiene of the new brain, or neencephalon. How shall we study

what goes on in this vast laboratory of millions of neurones, where, to adopt Mosso's phrase, one reads "No admittance" at every door and corner. Two ways of determining concretely what occurs normally in the brain have been used, namely, first, by observing the activities of an individual; second, by studying in the laboratory the reactions of a muscle or of a gland. The first method, especially the study of the spontaneous activities of children in play and other forms of motor reaction, gives important indication of the functioning and development of the brain. Some of the older investigators, Mercier (12) and Warner (15), for example, attempted a systematic study of cerebral development by the study of movement, supplementing observation by the use of various motor tests. The most important result of such investigation, apart from the determination of certain symptoms of disease, was perhaps the formulation of the general law of the sequence of this development, viz., that in a given physiological series the nervous control of the larger, more central, and more fundamental muscles, is acquired before that of the smaller, more peripheral, and accessory muscles; those of the shoulder and arm, for example, before those of the hand and fingers. But in regard to the higher processes of association, and the like, these investigators never succeeded in getting to very close quarters with the problem.

Recently the other plan of studying what occurs in the brain by studying in the laboratory the reactions of a gland or motor organ has been tried; and new and most ingenious methods devised. It is too soon to foretell the outcome; but the attempt to devise an objective method of studying the functions of the neencephalon is so important that a description of it in some detail should be given.

The pioneer of this objective study of the specific activity of the brain was Setchenov (11). The result of his study was published in Russian in 1863 in a work called "The reflexes of the cerebrum." His work was followed by that of Pavlov in Petrograd, whose preliminary results were published in 1897 in his book, "The work of the digestive glands;" and the most serious and most extended objective studies of the development of the associative function have been made by him and the Russian school of investigators who have collaborated with him. Assuming that associations are formed in the brain cortex, Pavlov (14) devised an objective test for association, and thus was enabled to study what happens in the neencephalon. His method is called that of the conditioned reflex.

The Conditioned Reflex. If I give a dog a piece of meat, immediately the salivary glands of the animal begin to function

and to secrete saliva. This is an ordinary reflex act. Now, if every time I feed the dog meat I ring a bell, after a time I may ring the bell without giving the meat, and yet the saliva reflex will occur and saliva be secreted. In the latter case an association has been formed between the auditory stimulus of the ringing of the bell and the ordinary stimulus of the meat. Physiologically the difference between this reflex and the simple reflex is that, in the former, lower centers alone function; in the latter, the connection between the peripheral stimulation and the response of the gland is mediated by the brain cortex.

The ordinary reflex act Pavlov calls an *unconditioned reflex*. The odor or taste of the meat is a biologically adequate, or as Pavlov calls it, an unconditioned stimulus; the secretion of saliva, the natural reaction. The salivary reflex on occasion of the ringing of the bell without meat he calls a *conditioned reflex*. This is due to the association of the indifferent stimulus of the bell with the biologically adequate stimulus of the food; and the ringing of the bell is called a *conditioned stimulus*.

Pavlov (4 and 14) and his students have made many investigations with an elaborate technique, chiefly upon dogs; and Boldirev (4), Kasherininova (4), Wurzel (4), and others have shown that every phenomenon of the external world for which an animal has perceiving organs, such as a tone, whistling, noise, cold, heat, mechanical stimulation of the skin, movement, and so on, is capable of association to produce a conditioned reflex in the animal.

Pavlov's students (4) have succeeded in establishing in certain dogs five or six conditioned reflexes and for different sense organs. Orbéli has made interesting observations on vision and the reflexes obtained by means of the visual organ. Zéliony and Bielakov have established a most marvelous acuteness of the auditory organ, and Kacherininova has shown that mechanical stimulation is a stimulus for the salivary gland, and still others have made similar observations for other senses. As a matter of fact any stimulus from any receptor organ may become associated with the biologically adequate stimulus and form the conditioned stimulus producing a conditioned reflex.

The significance of the conditioned reflex is simply this, that an associated stimulus brings about a reaction; and this associated stimulus may be from any receptor organ of the body; and it may be formed of course, not merely in the laboratory by our specially devised experiments, but by association in our ordinary environment.

We are familiar with the doctrine that a definite stimulus produces a definite reaction, that a group of stimuli, a situation, produces a definite reaction. We are familiar too with the doctrine that a normal organism is made up of tendencies to react, certain definite tendencies fitting definite situations like keys fitting locks. But in the conditioned reflex we have an indifferent, an arbitrary, if you please an unnatural stimulus, bringing about a reaction similar to the natural reaction because associated with it.

One should keep clearly in mind the way these terms are used. The ordinary reflex is called an unconditioned reflex, the reflex resulting from an associated stimulus is called a conditioned reflex, and the associated stimulus which produces the conditioned reflex is called a conditioned stimulus.

The formation of a conditioned reflex involves association; and the brain, especially the cortex, is generally assumed to be the organ of association. While we can find no dramatic beginnings, even for associative memory and the ability to profit by individual experience, nevertheless the neencephalon has developed especially as the correlative of associative memory, and the cerebral cortex has developed, we must believe, according to the neural law of association as suggested by the studies of Kappers, and we may best study its ability in different stages of maturity by testing its associative function.

That this method of the conditioned reflex actually indicates processes that occur in the brain cortex has been shown by the Russian investigators. Orbéli (4) expresses the results as follows: "We are altogether completely justified in considering the conditioned reflexes as a function of the cortex of the cerebral hemispheres. At least Tikhomirov, Makhovsky, and myself have succeeded in extirpating different zones of the cerebral cortex in rendering the formation of conditioned reflexes impossible for special receptive surfaces."

THE STUDY OF CHILDREN BY THE METHOD OF THE CONDITIONED REFLEX.

Dr. Krasnogorski (9 and 10) of Petrograd has employed Pavlov's method of the conditioned reflex in the study of children, taking as the response of the child to the conditioned stimulus a motor reflex, namely, the opening of the mouth in case of older children and sucking movements in case of infants. By the aid of this method he reports that he was able to observe in children quite accurately the origin, development and extinction of different conditioned reflexes and to establish certain laws for such reactions. In its simplest form his

method was merely to give a chocolate bonbon to a child and at the same time to give a sensory stimulus, for example, a dermal stimulus or the like. After a few repetitions the response of opening the mouth occurs without the bonbon if the dermal stimulus is given.

The investigation by Krasnogorski was a pioneer piece of work, the number of children tested was small, his apparatus was defective, his methods crude, the report of his results incomplete; but his work is so important as an attempt to use an objective method in the study of the functioning of the brain cortex in children that we may well give attention to it somewhat in detail. I shall give the account very much as he reports his results, even though they may need to be modified in view of more recent studies.

The mechanism of the conditioned reflexes in the child varies from that of the animal in different respects. The first characteristic in the child is the extreme rapidity of its acquisition. In the case of the normal child it is enough to let the effect of any stimulus occur in connection with the opening of the mouth from two to ten times for the temporal association to be formed and for the associated stimulus to call forth independently the opening of the mouth. Further characteristics of the conditioned reflex in the child are the high stability of the association formed and the ease with which it is broken down. The newly formed conditioned reflex in case of a normal child lasts for a long time, but at any time it can be quickly broken up and again reestablished.

The ability to form conditioned reflexes develops earlier for some children probably than for others. It develops earlier perhaps for some receptor organs than for others, and apparently it develops earlier for normal children than for the feeble-minded.

In the first two or three months of life, according to Krasnogorski, the cortical innervations are so little developed that the different associations in general cannot be formed. In the second half of the first year of life the formation of such associations for all receiving surfaces, the eye, the ear, the nose, skin, is possible; but it occurs more slowly than in later life. Not until in the course of the second year does the mechanism of the conditioned reflex attain its complete development and functional perfection. Miss Mateer (11), however, was able to establish conditioned reflexes at an earlier age in many children.

Memory Reflexes. The reaction of the salivary glands, as we have seen, will occur in response to an indirect stimulus, the stimulation of the skin, for example, occurring simultane-

ously with the feeding. Not only is this true, but Pavlov found that the mere memory of the indirect stimulus may also bring about the response of the glands. If, for example, a dog is repeatedly fed, not during the period when the skin is stimulated, but not until two minutes later, that is, after the immediate stimulation of the skin has passed and there are in the cortex only traces of this stimulation, then after some repetitions the direct stimulation will call forth no secretion, this does not occur until two minutes afterwards; thus not the skin stimulation as such, but the memory of this becomes the excitation for the salivary glands. The same is true of the child. If a child is repeatedly given a chocolate bonbon, not when the dermal or other sensory stimulus is applied but two minutes later, then after a dozen or more repetitions the response of opening the mouth will occur, not when the dermal stimulus is applied, but two minutes later. This class of conditioned reflexes Krasnogorski distinguishes as specific residuum reflexes, or we may call them memory reflexes. The characteristics of these distinguish the functioning of the human brain from that of the animal.

The memory reflexes in case of the dog show quite distinct characteristics. They are completely free from any specific character, such as characterizes the usual conditioned reflexes. If, for example, a reflex is formed for the memory of dermal stimuli, then the secretion of saliva occurs not only after the skin stimulation, but after all other possible stimuli—tones, noises, smells, etc. Another characteristic feature of this reflex is its unusually quick almost sudden extinction, the great secretion of saliva, and the vigorous motor reaction. It is very different in case of the child. A highly specific character and extraordinary precision are characteristic marks of memory reflexes in them. If, for example, in case of a child the memory of the sound of a metronome is made the excitation for opening the mouth, then the motor reaction occurs from the beginning only after this stimulus, while other stimuli, even related ones, for example the blow of a hammer, are absolutely ineffective. Every memory of a stimulus in case of a child is highly specific and can quickly be brought into temporal association with any activity whatever.

There are also essential differences between man and the animal in respect of the *formation* of the memory reflex. In case of the dog the memory reflexes are formed with great difficulty and easily destroyed. In case of a dog too, it is enough to repeat the memory reflex only once without the unconditioned stimulus to destroy the reflex. In case of children, on the other hand, the memory reflexes are formed as easily as the

usual temporal associations. The memory reflexes are destroyed in case of the child, not suddenly, but just as the simple conditioned reflexes are. Thus the highly specific character of the memory reflex, the quickness with which it is formed, its duration, its regular and gradual extinction, are the characteristics of this group of reflexes in children.

The development of the mechanism of the memory reflex in the child occurs much later than the development of the mechanism of the usual conditioned reflexes. While the ordinary conditioned reflex may be formed in the first year of life, the mechanism of the specific memory reflex, on the other hand, according to Krasnogorski, it is not developed until during the second year.

It is interesting that in case of a definite type of "over-excitable neuropathic" children, the specific character of the memory reflex is greatly reduced. In case of imbecile and debilitated children its formation is difficult; in case of many idiots it is altogether impossible. As a clinical test, according to Krasnogorski, the memory reflex is of great importance since it determines the degree of development and the accuracy of the functioning of the cerebral hemispheres and makes possible the diagnosis of cerebral anomalies at an early age.

Analysis. The next fundamental mechanism in the functioning of the cerebral cortex studied by Krasnogorski is what he calls the mechanism of analysis, or sensory discrimination. Besides the ability of forming temporal associations there occurs also in the cortex the extraordinarily extended analysis of stimuli from the periphery. According to Pavlov's terminology Krasnogorski names the nervous mechanisms functioning this, analysers. The analysers separate the external stimuli into parts, and by the mechanism of association these parts at any moment can be brought into contact with any desired activity. In a word, the function of the analyser is the differentiation of stimuli, or sensory discrimination.

Inhibition. Pavlov and his students have made interesting investigations of inhibition. If one scratches a dog every time he is fed, then the scratching becomes a conditioned stimulus; that is, it occasions a secretion of saliva when no food is given. Now when a conditioned reflex of this kind has been formed, if during the scratching stimulation a new stimulus, say, for example, a tone which has been made a special stimulus is added, immediately the scratching stimulus loses its effect. Also the adding of another unusual tone to a usual one inhibits the salivary reflex, and the intensity of the inhibition is dependent on the strength of the given tone. In like manner a great

number of subtle and most varied influences act to arrest the conditioned reflex.

In all development and training of the central nervous system, inhibition is as important as response. According to Krasnogorski stimulation and inhibition are in a certain sense the two halves of one and the same activity of the nervous system. Krasnogorski maintains that in the conditioned reflex we have an almost ideal method of investigating the process of central inhibition in children.

In the child's central nervous system all kinds of inhibitions are occurring, but the mechanism of inhibition attains its highest development in the human brain. In Krasnogorski's earlier investigations, when studying the memory reflex, the fact of the extremely fine and high development of the mechanism of inner inhibition in case of the child appeared. The formation of the memory reflex, as shown by these investigations in Pavlov's laboratory, rests on the development of special processes of inhibition. But this inhibition develops very slowly in case of a dog and is incomplete. Consequently the memory reflexes have only a general character and disappear quickly. It is very different with the child. The quickness of the formation of the specific memory reflex, and the quick development of the inhibition produced by a definite stimulus, the high specific character of the memory reflex, its slow gradual extinction, and its easy revival, appear to be fundamental characteristics of the reflexes of this group in case of children.

The formation of conditioned inhibitions similar to the conditioned reflexes occurs more quickly in children than in animals. The development of the mechanism of the conditioned inhibition occurs in case of the child at the end of the first year of life. This result is important as it shows that at this time the child can be educated. The mechanism is formed differently in the case of different children. In the case of the normal child, five to ten experiences is enough. The rapidity of development, the strong inhibitory effect, the quick extinction and the slow fading out in course of time, are characteristic marks of the conditioned inhibitions in case of the normal child. It is different with pathological children. With many idiots and imbecile children the conditioned inhibition cannot be formed at all or only with great difficulty, and the inhibitions formed for the most part have a very weak inhibitory effect and are very quickly extinguished.

Storing and Discharge. Dr. Krasnogorski (10) studies also another mechanism, that of nervous storing and discharge, which in his opinion represents the greatest complexity and the greatest power of adaptation in the child's cortical activity.

In the case of a child five years of age a conditioned reflex had been formed for the sound of a loud ringing bell. For some days repeated dermal stimulations were made without giving bonbons. As a result the skin stimulation as such was made, he thinks, completely indifferent for the child's nervous system. Then he began again the ringing of the bell, between the separate dermal stimulations, without accompanying the ringing with chocolate, but giving the bonbon only during the dermal stimulation following the ringing. The ringing served as a signal that the first dermal stimulation following would be accompanied by the giving of chocolate. As a result the first dermal stimulation after the ringing became specific and after some repetitions produced the motor act.

The following is a concrete example. A definite point on the skin of the upper arm was stimulated. No reaction followed. After ten minutes this stimulation was repeated, with no reaction; then after ten minutes more the bell rang for half a minute. The child showed no reaction. After three minutes the given place on the skin was stimulated, and then a vigorous reaction of the mouth occurred. Thus neither the ringing of the bell nor the stimulation of the skin alone could excite the motor apparatus. Not until the skin stimulation followed the ringing did the motor act occur.

It is clear that by the stimulation with the ringing a center of stimulation is developed in the cortex. The energy remains stored up in a latent or inhibited condition, but can be discharged at will as soon as the dermal stimulation is received. In this case the dermal stimulation in a certain sense is like pulling the trigger of a loaded gun. We load the nervous mechanism with the ringing stimulus, and this load remains in the cortex and can be discharged at any moment if we move the trigger, that is, if we give the dermal stimulation.

The mechanism of storing and discharge is broken down also in the usual manner by withholding the bonbons which served as the stimulus.

The mechanism of positive and negative storing and discharge, according to Krasnogorski, gives man his great superiority over the animals. It is developed relatively late in children, later than the other mechanisms described. It begins its function at the end of the second year of life, but is still incomplete. Not until the third year of life does it attain its full functional development.

This mechanism is most easily affected by pathological conditions. In case of the majority of nervous children it is seriously disturbed. In the case of one class of neuropathic children, what Krasnogorski calls the over-excitabile type, the

formation of this mechanism is very quickly completed, but it persists only for a short time and is soon dissipated. In other words we have children here who learn very easily and who lose very quickly what they have learned. In case of a second type of neuropathic children, the dull type, the storing of energy is effected with extreme difficulty. In the case of still another type, the storing is extremely easy, the discharge on the other hand occurs with great difficulty. There are children with weak inhibitory mechanism who are very hard to educate since errors are acquired quickly and held very obstinately. With many idiots and imbeciles the formation of positive and negative storing of energy is completely impossible.

What we have in such cases of storing and discharge is a delayed reaction, and the amount of delay possible seems to be roughly correlated with the mental development of the individual. Mr. Hunter (8), in a recent number of the *Behavior Monographs*, has reported experiments on delayed reaction which are very interesting in connection with some of Krasnogorski's work. Mr. Hunter experimented both with animals and children and found that within certain limits, "rats (one excepted), dogs, raccoons and children, made successful reactions in situations where the customary determining stimulus was absent at the moment of response." In case of children the experiments were arranged as follows: The child when released by raising a gate was told to push one of several buttons on the wall, and told that one of them would make a noise, and, if the child pushed the noisy button first, he would receive candy. Then a light was placed over the noisy button. The child was held five seconds and then allowed to push the button, then the period of delay before releasing the child was increased continuously until an error was made. The maximum delay for rats was ten seconds, for dogs five minutes, for raccoons 25 seconds, for children twenty-five minutes.

The cortical mechanisms described by Krasnogorski represent fundamental forms of the child's cerebral activity. Only by the clinical test of the ability of the child to make temporal associations, conditioned inhibitions, and specific memory reflexes, only by determining the power of analysis and by the investigation of the mechanism of storing and discharge, can we understand and analyze the true relations in the child's cortical activity. The neurological basis of these associations is apparently the development of temporary centers or foci of stimulation in the cortex. According to Krasnogorski the fundamental characteristics of these centers are their temporal and conditioned character and extreme instability. Their size and extent is in constant process of change according to the

degree of the differentiation and the conditions of function of the other parts of the cortex. We must assume that the whole cortex is sown with such conditioned centers, which now arise, now disappear, now enlarge, now grow smaller, and are connected with this or that cortical system according to the conditions of their origin.

As pointed out by Krasnogorski, many things modify the ability to form conditioned reflexes, especially all sorts of pathological conditions; fever, cerebral lesions, and idiocy, for example, making the formation of associations much more difficult or entirely impossible.

Among neuropathic children as regards the conditioned inhibitions there are different types. With the over-excitabile type the conditioned inhibitions are very easily formed, very quickly extinguished, and extraordinarily quickly destroyed by time. On the other hand in the case of the dull neuropathic children, they are formed very slowly and relatively strong stimuli are necessary. In the case of certain children of this group the conditioned inhibitions persist for a long time, although in the case of others they show a very unstable character and are likely to be quickly destroyed. The latter are the children who learn with great difficulty, forget quickly what has been learned, and for that reason are very difficult to educate.

The most extensive and thoroughgoing application of the method of the conditioned reflex with children has been made by Dr. Florence Mateer (11) in an investigation carried on at Clark University. Her study has demonstrated the practicability and value of this test as an objective method of studying child behavior.

The results of this method as stated by Krasnogorski must, of course, be verified. This to a large extent Dr. Mateer has done. She has modified and improved his method and used it in the study of both feebleminded and normal children, 67 in all. Her task was primarily to test the value of the method, but she obtained interesting and significant results. Furthermore Dr. Mateer compared the results found by this method of the conditioned reflex with the results of the other usual methods—the Binet-Simon, Yerkes, etc., and calculated the correlation coefficients of the results found among her unselected group of 50 children.

Dr. Mateer's results are significant and suggestive in regard to the development of the child's ability to form associations. The one general significant result being that the power to form associations increases with increasing age. She sums up her results as follows:

"It is clearly to be seen that up until the age of five the

number of trials necessary for the formation of the conditioned association decreases rather regularly as the chronological age of the child increases. Above this the curve is not only less regular but the range of trials necessary for any one age is also greater than for the ages just preceding. This can hardly be due to any great difference in the ability of the older children as a group, for they were in most instances (in 15 out of 20) the older brothers and sisters of the younger children used. It may be possible that we have here a symptom of an innate difference of different periods of development. The older child may see or imagine, because of his greater experience, and consequent greater potentiality of associations, possibilities of variation in the procedure to which the younger child is oblivious being absolutely sure after he has been fed candy under a given condition once or twice that it will appear again under like conditions. Genetically viewed, this difference may be as significant as a mark of old stages of development as are the differences recognized to-day between the adolescent and the pre-adolescent."

The ease and quickness with which children develop the ability to form associations differ greatly with different children. Representative results are given by Dr. Mateer (11), who says:

"It may be interesting to note that no child over two years of age needed more than eight trials while none under that age used less than seven, none under three years needed less than six, while the minimum number, three, was all that were required by a child in the fourth year. Out of the fifty children, regardless of age, ten needed only three trials, eleven needed four trials, eleven used five trials, while only seven needed six; five needed seven, four needed eight, and two, nine trials."

As President of the American Psychological Association at its annual meeting in 1915, Dr. Watson (16) gave an account of preliminary investigations that he has made using one of Bechterew's methods, namely, producing the reflex by giving a sound stimulus in connection with a strong electro-tactual stimulus.

Dr. Watson's device was to give an electric stimulation of the finger, the experimenter sitting in a different room provided with a bank of keys by which he could give at will the sound of a bell coincidentally with the electric current or separate from the current.

He proceeded as follows. In beginning the work with a new subject he first sounded the bell to see if this would directly produce the reflex. In no case did he find the reflex

evoked by the bell alone prior to the electric stimulation. Next the bell and shock were given simultaneously for five trials, then the bell was tried again. If there was no reaction then five more stimulations with the bell and current simultaneously were given, and so on. He found that the conditioned reflex would appear at first haltingly, that is, appear once and then disappear. Punishment, or the electric shock, is then again given. It may next appear twice in succession and then disappear. After a time it appears regularly every time the bell is sounded and he reports that he obtained a conditioned reflex in the best cases after 14-30 combined stimulations.

Watson's experiments were tried on eleven human subjects, one dog, and seven chickens. In the case of the dog he stimulated the sole of the foot and recorded the resulting leg movement. Six of the seven chicks showed the conditioned reflex in the respiratory curve. In one he failed to get a reflex.

In the course of twenty minutes the investigators obtained the reflex several times upon an eight year old boy. "When first punished by the electric shock he cried and was somewhat reluctant to continue the experiment. He was promised a moving picture show after the experiment and this made him complete the series with smiling fortitude."

Watson summarizes the various uses to which he thinks this method may be applied, as follows:

"1. To all forms of experimentation on light, size, form, visual acuity, etc. It is apparently the only method which will enable us to study visual after-images in animals.

"2. It is apparently the only existing method of testing auditory acuity, differential sensitivity to pitch, range of pitch, timbre, etc., in any reasonable length of time.

"3. It affords us, by reason of the fact that the stimuli may be given serially, a method of testing the rôle of olfaction. We know nothing now concerning olfactory acuity, differential sensitivity to olfactory stimuli, classification of stimuli, the effect of such stimuli on the emotional life of the animal, etc. Nor is it very feasible to carry out such experiments by the discrimination method.

"4. The method gives a reliable means of testing sensitivity to temperature and to contact and to the fineness of localization of such stimuli—factors which likewise cannot be determined by methods now in use."

Illustrations of the significance of the conditioned reflex in pathological phenomena have been given by Heilbronner and Watson. The latter gives the following examples of conditioned motor reflexes:

"In the moving picture tragedies the suicide of the villain is often shown. Usually the hand only of this unfortunate individual is displayed grasping a revolver which points toward the place where his head ought to be. The sight of the movement of the hammer on the revolver brings out in many spectators the same defensive bodily reaction that the noise of the explosion would call out. Again we find in persons recently operated upon numerous reactions such as deep inspirations, cries of pain, pronounced muscular movements, the stimuli to which are the cut and torn tissues themselves. For many days after the disappearance of the noxious stimuli the reactions will appear at the slightest turn of the subject's body or even at a threat of touching the wound. Similar instances of this can be seen in many chronic cases. In such cases the charitable physician characterizes the patient as having 'too great a sensitivity to pain.' The patient, however, is not shamming in the ordinary sense: conditioned reflexes have been set up and the subject makes the same profound reactions to ordinary attendant stimuli that he would make to the noxious stimuli themselves,"

This method of the conditioned reflex has now been used by a number of Russian, French, and American investigators. The demonstration of its value in the study of children by Krasnogorski in Russia and Drs. Mateer and Watson in this country constitutes an epoch-making contribution to genetic pedagogy and school hygiene.

Krasnogorski has suggested that the so-called tests of intelligence should be replaced by the purely physiological investigation of these cortical mechanisms. He emphasizes the great clinical importance of this conditioned reaction. With the help of this, it is possible, he says, not only to follow the whole development and growing complexity of the cortical activity of the child from the first weeks of life, but also in different pathological processes to establish objectively the degree of disturbance. The test of the cortical mechanism gives also the possibility of showing in the first months of life the peculiarities and defects of the cerebral functions, and thus of beginning pedagogical training at an early age. If the method is all that Krasnogorski claims for it, it would seem likely when developed to give an objective and more satisfactory method of testing the intelligence of children, especially young children, than any other tests we now have.

HYGIENIC SUGGESTIONS

The study of the conditioned reflexes throws light on many things in human behavior, not only on the obvious phenomena

of habit and association; but on many other things in ordinary everyday life, for example, the peculiar behavior of many children, the tricks and mannerisms and forms of misbehavior of normal children as well as the hysterias and defects of the abnormal, the bizarre acts of adolescents and adults, the peculiar disorders and neuroses that often occur, the eccentric character of many crimes, as well as many ordinary forms of behavior. The writer will venture to suggest a number of examples where the question may be raised whether they be not cases of conditioned reflexes.

The question naturally arises how is the conditioned reflex related to habit. Habit is a generic term used rather loosely for any customary reaction. From any instinctive reaction or response a habit or group of habits can be developed. But also conditioned reflexes may be developed in connection with any instinctive response. Eating, for example, is an instinctive reaction. Of the habits connected with the instinctive response of eating, are those in regard to the method of eating whether one chews on one side of the mouth or the other, whether one eats rapidly or slowly, whether one takes large mouthfuls, or small mouthfuls, and so on and so on. Of the conditioned reflexes connected with eating, of which Pavlov has given us illustration, is the response of the secretion of saliva and the digestive juices to the dishes perhaps in which the food is served, the flowers that may be on the table, the companions, and what not.

The line of distinction between habits and conditioned reflexes is not clearly marked. All conditioned reflexes are incipient habits. Many habits are conditioned reflexes at the outset. But we use the word habit in a loose sense referring to many instinctive reactions or those developed pretty directly from the instinctive reactions as well as to more artificial responses like the conditioned reflexes. Habit is a more generic term. Again habit usually connotes reactions of a rather stable and permanent character; conditioned reflexes are usually unstable and often temporary in character.

Modern study, however, has made the doctrine of habit much more vital and significant. The studies of the conditioned reflex suggest that a habit involves a series of such reflexes; and this has brought quite a new point of view, a new conception of habit, and emphasized the significance of habit for the health of the individual.

For every form of motor activity, for all the situations of our daily life, for all the receiving organs of our body, such habits are developed. And all this shows emphatically the significance of the education in this sense during the early

years of life. We see again that the acquisition of habits of healthful activity both physical and mental is the one thing of prime importance in the education of children in the early years. If this is acquired, it does not matter if little in the way of scholastic education is given, but nothing can atone for the loss of opportunity at this period and the acquisition of undesirable and pathological reflexes.

We know relatively little about the conditioned reflexes and habits developed by our ordinary school and home environment; but the studies made show the vast number of them developed in a child during the period of school life, groups of habits and associations for every subject of study in the curriculum, perhaps for every teacher and companion, and the importance of these for the mental health of the individual. Let us note some examples of conditioned reflexes in animals and children.

In the training of animals, of course, we have many illustrations of the conditioned reflex. Kallischer has given so-called tone training to different animals; to monkeys, for example, giving them food with a certain definite tone and withholding it with other tones; and he habituated them to grasp the food only at the proper tone, that is, the tone associated with the giving and eating of the food. In all such training of animals it is very easy to spoil the animal by a mistake or an unfortunate occurrence, which may act as a permanent inhibition, examples of which could be furnished by all animal trainers.

The remarkable inhibitory power that certain trained dogs show is a noteworthy illustration of the conditioned reflex. For example, a Boston terrier was taught to sit in a chair while meat or other food was placed on the floor until permission was given to take the food. Again the dog's favorite food was placed directly under his nose and he was told not to take it; and then, even if the people went out of the room and left the dog alone with his food, he would not touch it until they returned and permission was given.

If one reads a book like Bostock's "The Training of Wild Animals," (1) one sees how largely the training consists in the development of conditioned reflexes. A wild animal, as Bostock points out, is trained but never tamed. A shock, an unusual occurrence, or any one of a hundred unconventional things may arouse again the old savage instinctive reactions. Hence the trainer must always give the performance in the same way and must always give the conventional signals as stimuli.

"If an animal is sent to the right side on entering the arena the first day, he is sent to the right every day thereafter, and the direction in which he goes after leaving his pedestal, and before taking his place in the group, is always the same. Each animal, too, in a group has his own place and his own time for assuming the place; and should he once leave it, there would be danger to the whole performance. The trainer, too, even in walking about the arena, always walks in the same way, and gives his closest attention to the prevention of the happening of anything unusual.

"Performing animals particularly dislike a change in the stage setting, and it is absolutely necessary, whenever a new one is contemplated, to accustom them to it by the most gradual means. There have been times when an animal, seeing a new barrel or block for the first time, would attack it with such gusto that not only would the objectionable piece of furniture be destroyed, but so much excitement would be communicated to the other animals that it would be found impossible to go on with the act."

According to Bostock most wild animals are fond of music and in most cases it is their principal cue. Naturally enough it becomes a conditioned stimulus for many reactions. He relates the following experience which is instructive.

"Some time ago the band of a traveling show went on strike in the middle of a performance, and left in a body. Three trained tigers were the next feature on the program. When they came on they looked inquiringly at the orchestra for the music, and then two of them quietly settled down on their haunches and refused to go on. The third, who was of less experience, made a feeble start and then joined his companions on strike. Orders, commands, threats, and flickings of the whip were useless. No music, no performance, was obviously the motto of these tigers; and they stuck to it until finally the trainer, finding that to try to force them further was dangerous, was obliged to let them return to their cage without giving any performance at all."

Bostock feared that he could never get the animals to perform again, but the next day when the musicians had returned to their work the tigers seemed perfectly satisfied as soon as they heard the music and acquitted themselves better than ever. Clearly the sound of the music had become a conditioned stimulus to the performance of the animals.

In the special training of animals we have to do chiefly with the establishment of conditioned reflexes. A great part of the more special training of a dog, for example, consists precisely in this. The best illustrations perhaps are furnished by those cases where a conditioned reflex closely related to a natural reflex is established.

A friend of mine taught his dog to sneeze at the word of command. I asked my friend how in the world he succeeded in teaching the dog to do this. He told me that in the first

place he rubbed the dog's nose and made him sneeze in this way, and then praised him for it, and after a time the dog acquired the habit, so that he would sneeze at any time at his master's command.

Here we have apparently an excellent illustration of the development of a conditioned reflex. First, by rubbing the dog's nose an unconditioned reflex was produced, sneezing in response to the peripheral stimulation; then giving the word of command to sneeze in connection with the stimulus of rubbing the nose we have in the ordinary way a conditioned reflex developed; the word of command being of course the conditioned stimulus, and this becoming associated with the unconditioned stimulus of rubbing the nose, until finally the associated stimulus, namely, the command, was sufficient by itself to produce the reaction.

In the training of children the development of conditioned reflexes is quite as important as in the training of animals. On the functional side, as we have seen, the most important difference between the child and the adult is that the child is lacking in experience and its brain relatively free from paths of association, and the possibilities of **development of** conditioned reflexes and habits are great. And again the child has great ability for developing and for breaking down conditioned reflexes because of the plasticity of its nervous system. This apparently is quite apart from the fact that in childhood the field is not yet occupied.

In children one may often note the development of conditioned reflexes by careful observation of incipient habits of speech, gesture, or the like. An observant mother notes that her baby reacted to the first stimulus of the bath by closing her eyes. Now at six months she always closes her eyes when she sees the ordinary preparation for the bath. The associations formed in connection with bathing and the like offer perhaps quite as good an opportunity for testing the child's ability to form conditioned reflexes as those formed in connection with eating. Apparently the child can form conditioned reflexes at a much earlier age than Krasnogorski seems to suppose. Experiments indicate this and observation as well. Apparently a case in point has been reported to me of a child about a month old that was fed with orange juice from a spoon, and at the mere sight of the spoon would open its mouth at once.

Such conditioned reflexes and inhibitions are formed in the early years under the stress of circumstances and by the training of parents and nurses. Many of these are distinctly important habits of health. The young child soon learns, for

example, not to void secretions at the direct stimulus of pressure, but only on occasion of associated stimuli—the customary place, or seat, or the like. The processes of secretion and digestion even are modified by these acquired conditioned reflexes.

Some individuals, for example, cannot have a proper movement of the bowels without smoking a cigar. In the case of others a definite time of the day is necessary. Many must have customary surroundings, and as a result suffer from indigestion in the first days when on a journey. And here there is great danger that undesirable and unhygienic habits may be formed by children. In many individuals the lack of proper habits in regard to digestion and secretion is a most serious menace to health.

Again the habits of cleanliness in the case of the child involve the development of conditioned reflexes.

Especially significant for the health of children are the conditioned reflexes developed in relation to sleep. If with Claparede we look upon sleep as an active process, the act of dropping asleep comes under the general class of reflex activities, and under certain conditions may become a conditioned reflex.

In the course of recent years different workers in Pavlov's laboratory have complained that a somnolent condition of the animals experimented upon handicapped them in their investigations. This difficulty appeared if one chose as a stimulus a heat of 45° or zero condition of cold. In the latter case the experiment would terminate in a profound sleep and complete cessation of all nervous activity.

For a long time the workers in his laboratory noted with surprise the contrast which appeared between the great vivacity and mobility of a dog before the experiment and before his condition of somnolence, then the sleep as soon as the experiment began. It appeared that the cause of this was not in the conditions of the experiment, but that it must be sought in the action of the temperature. Different experiments showed that on one and the same place of the skin one and the same degree of heat or cold inevitably brings the animal sooner or later to a condition of somnolence, and even to a profound sleep. Thus it is argued that a determining agent in the external world can arrest the higher nervous activity in the same way that other agents stimulate the same functions.

As is well known, any number of things may become conditioned stimuli for going to sleep. This is well known in the case of children and many who are troubled with insomnia.

In case of the child it is easy to develop unfortunate conditioned reflexes in regard to sleep. Many children, for example, are trained so that they cannot go to sleep unless there is a light in the room. It is quite as easy and more natural and healthful to train a child to go to sleep as soon as the light is removed from the room.

The ordinary reflex in many cases is strengthened by the conditioned stimulus. Some individuals who use an alarm clock find that they are most sleepy when the alarm clock strikes, and so set the alarm at an early hour in order that it may serve as a conditioned stimulus to give them the pleasure of another nap. In the case of others the alarm serves as a distinct help toward getting up. The ordinary stimuli are not sufficient to cause the reaction of arising from the bed, and the conditioned stimulus furnished by the alarm makes the reaction easy.

As we have seen, the sensation from any organ of the body and probably any event may become a conditioned stimulus for the reaction of a gland or a motor organ. Since the tendency in everyone is strong to form such reflexes and since the opportunity in our complex environment is so great, one wonders that more unfortunate habits rather than less are not developed in children, and one is surprised that not more rather than less abnormal cases should occur. And one sees, finally, the great importance of normal pedagogy and mental hygiene in the care of the young.

PATHOLOGICAL REFLEXES

Heilbronner (6) has attempted to show, how many of the bad habits and neuroses of children are really conditioned reflexes, and he quotes a number of specialists in children's diseases to illustrate this point. He emphasizes further the fact that the opportunities for developing pathological neuroses by the formation of conditioned reflexes is very great. In fact the tendency to this is universal.

The ease with which a pathological conditioned reflex may be developed and the great danger of the development of such reflexes in case of children, are indicated by such neuroses as the so-called tics and the like. In such cases, at greater or less intervals, in severe cases at intervals of fractions of a minute, convulsive twitchings occur which cannot be suppressed. It is very probable, as Heilbronner points out, that the most identical phenomena may have a different origin in different cases; but for a part of the cases, undoubtedly he thinks, the course of development is as follows. First some

external stimulus, frequently a stimulus from the conjunctiva of the eye on account of an inflammation or a foreign body in the eye, gave occasion for a thoroughly normal tendency to winking and twitching as a defense reaction, or a pain reaction, which, after the passing away of the stimulus by cure of the inflammation or removal of the foreign body, still persisted; just as everybody has noticed how long the tendency to protect the eye by the hand continues after some dust or the like has been removed from it. The movements also persist at a time when the patient himself believes that he no more perceives the stimulus, when he has even forgotten perhaps the original occasion of the reaction. The process corresponds throughout to the development of conditioned reflexes with this difference, that it is not a question here of the association of one reaction with a quite new stimulus, as in case of the secretion of saliva on occasion of a definite tone, but of the occurrence of reactions which otherwise appear on occasion of qualitatively identical but quantitatively much stronger stimuli, but now occur on occasion of minimal and subjectively imperceptible stimuli. And further proof that in this case something analogous to the conditioned reflexes occurs, appears from the fact that in favorable cases a cure can be effected in the following way. If one has eliminated the twitchings for a time by reducing the sensitivity of the conjunctiva by a drug they no longer appear when this treatment ceases, that is, when the same stimuli which previously produced the twitchings become active again. The same is true in case of the dog if one does not reinforce the conditioned reflex from time to time by connecting it with the unconditioned reflex.

Heilbronner discusses the well known tendency for diseases once cured to recur, and for habits once broken to appear again. Pathological habits of course are no exception to this general rule. The result of the most fortunate cure is always subject to this danger of a relapse. This danger is especially great if the same circumstances, that is, the same conditioned stimuli under which the pathological habit originally developed return in much the same form. But under certain conditions other stimuli apparently quite indifferent are able to revive the habit supposed broken. In hysterical conditions this rôle is most frequently played by shock or some other emotional event. The old habit returns again more easily the more frequently the breaking and revival of the habit have occurred. This corresponds with the experience of daily life in regard to habit as well as with the results of experimental investigation.

"Another observation more removed from the experiences of daily life is frequently made. It is well known that the result of treatment in many pathological cases is not connected with the kind of cure adopted, but with the form in which it is applied. Thus the psychiatrist may fail with his efforts at cure until he decides to resort to some measure which, as the patient says, has always helped, and which perhaps some old shepherd has recommended. There are many analogies with the artificially created conditions for normal activity of the intestines. Whoever is concerned with the treatment of convulsive or periodically acute disturbances is acquainted with these peculiarities and has ultimately to consider them. In the clinic there is an abhorrence of the electrical treatment of hysterical disturbances. And the electrical current therefore plays a very small rôle, but if a servant girl has come to the polyclinic with an hysterical paralysis of the vocal cords in order to be treated by electricity, because this 'has always helped,' and because on account of her hoarseness she fears she will lose her position, we are not so doctrinaire as to refuse the fulfillment of her wish."

Ibrahim has attempted to show that the so-called *Wegbleiben* of the Germans, that condition where children scream, lose their breath and grow black in the face, is to be considered as a conditioned reflex. This author assumes that in such children on the basis of some special inherited disposition it is only necessary for the cessation of respiration to occur once in a fit of passion for a conditioned reflex to be established. That is to say, when the child loses his breath in a fit of passion and crying, the crying becomes a conditioned stimulus for the stopping of the respiration, and so afterwards every time the child cries in a fit of anger the losing the breath will occur.

While this explanation may not be the true one, it is suggestive, Heilbronner points out, of what is probably the true explanation of a number of other phenomena observed in children. In this *Wegbleiben*, or losing the breath, in children, it is clearly a question of conditions in which psychic factors have a great influence, but which can scarcely be subject to voluntary choice and clearly not a question of the child's design.

For illustration, a child has to pass by a dog's kennel, when suddenly the dog rushes out barking, without, however, being able to do any harm because chained. The child cries, tries to run away, falls, and remains crying and trembling, and is calmed again after a longer or a shorter period with or without any clear recollection of what has happened. The event for the time being remains without any result; but it is noticeable that the child attempts to go around this spot in which the event occurred. It is thought unpedagogical to permit this timidity; the child is forced to walk again by the kennel; but before it comes into the vicinity of the dog

again, the attack of fear recurs. Further attempts at education in this direction are given up; but at any opportunity brothers and sisters or playmates tease and laugh at the child for his timidity. The result is a new attack. This occurs more and more frequently, and under continually varying conditions with each unpleasant impression, a difficult school task, the denial of a wish in case of very slight physical indisposition; and finally even on occasion of pleasant events and a pleasant surprise, or the expectation of such.

The analogy with what has been discussed before in regard to the conditioned reflexes is unmistakable; but an essential difference exists here in the fact that in the typical cases of the development of a conditioned reflex it is a question of the regular and legitimate combination of an accurately circumscribed stimulus with a definite reaction; but in the last example we can trace the way the circle of factors effective as stimuli keeps becoming larger—from the repetition of the original affective situation to the mere mention of the same, and from this to unpleasant situations in general, and finally, to events which have nothing more in common with the original conditioned stimulus than the quality of their affective tone.

The type of the course of events described here is one of everyday life in hysterical attacks, which arouses feeling under similar circumstances. Passion is the first factor which acts as a stimulus. Then one or more repetitions in a certain connection with this, then a mere reminder of this is sufficient, and soon a habit, with the result that the attack then becomes an habitual reaction to all affective occurrences. Finally it is so extreme that it is impossible for the observer to show the affective origin of the separate event, which may be rooted in internal events, memories, or the like, so that the latter appears to result without any cause, of itself. What is true for the hysterical attacks, with slight modifications is true also of other hysterical conditions. A patient has perhaps as a result of an inflammation of the larynx an hysterical paralysis of the vocal cords. The danger is great that every slight cold, which in case of other persons would be cured entirely in a few days, will again leave behind it for a while the same symptoms; not infrequently one finds later that paralysis of the vocal cords is connected with every affective condition in the widest sense.

We can go through the many symptoms of hysteria for the most part in a similar manner. The cure of hysterical symptoms can be based also on the development of conditioned reflexes as pointed out by Heilbronner.

The study of the conditioned reflexes shows that the condi-

tions likely to produce pathological habits are universal, and that everyone is in danger of acquiring pathological reflexes. A number of problems at once arise. Why do those habits we call abnormal develop only in case of a minority of individuals? Why does one individual show a tendency to their development in one direction and another in quite other directions? Why in the case of one individual do hysterical symptoms appear, and why in the case of others some other form of pathological symptom? Heilbronner suggests that the answer to these questions is, that at the foundation of these habits are certain inherited defects, a disposition. Pathological habits presuppose an abnormal individuality as the soil on which they develop.

We may stop just a moment to consider one of the trials and frequently one of the dangers of childhood, namely, the taking of medicine. Probably we can all recall this experience; with fond and ignorant parents it has been well nigh universal. It is a curse of childhood that like the blessings of rain and sunshine falls upon the evil and the good, upon the just and the unjust, alike.

The evil from the taking of medicine is due not only to the drugs contained in it, but also to the ease with which conditioned reflexes are formed. The medicine becomes a conditioned stimulus for sleep, or digestion, or the like. With children there is danger that a drug habit, or if nothing worse, a medicine habit, may be developed. Here especially it is usually wise to let children alone if one does not know what to do for them.

The instincts of children are usually wholesome, and as regards eating and drinking and play and sleep and the like, they are usually more nearly right than the over-anxious parents. In hygienic matters an intelligent ignorance on the part of parents is especially desirable, and unfortunately this is precisely what is usually lacking. And even intelligent parents sometimes do the most atrocious things in the management of their children. Many perhaps can recall the decoctions of herbs and muddy mixtures they had to take in the spring of the year. Booth Tarkington has given a beautiful example, which, if it be not true, is invented with sound hygienic insight. Penrod's Nervous Breakdown should be read and pondered by every fond parent.

Mrs. Schofield became anxious about the health of her boy Penrod. A neighbor told her about a medicine that she had given her own boy with good results. Mrs. Schofield procured it at the druggist's. She attempted to give it to Penrod. The boy rebelled and asserted that he was well. The father was

called in; the boy was forced to take the medicine. The medicine proved odorless and gave no warning of what it was about to do. In the case of Penrod the surprise was complete and the effect shocking. But the dose was two tablespoonfuls before each meal, and the feat of giving it to the boy was finally accomplished.

"So the thing was done and the double dose put within the person of Penrod Schofield. It proved not ineffective there, and presently, as its new owner sat morosely at table, he began to feel slightly dizzy and his eyes refused him perfect service. This was natural, because two tablespoons of the cloudy brown liquor contained about the amount of alcohol to be found in an ordinary cocktail. Now, a boy does not enjoy the effects of intoxication; enjoyment of that kind is obtained only by studious application. Therefore, Penrod spoke of his symptoms complainingly, and even showed himself so vindictive as to attribute them to the new medicine.

"His mother made no reply. Instead, she nodded her head as if some inner conviction had proven well founded.

"'Bilious, too,' she whispered to her husband."

Three doses of this alcohol mixture, which the mother was unwittingly using, were given. And then the boy showed a surprising readiness and willingness to take the medicine. This continued until two bottles and a half were taken; the mother noted improvement in her son, or rather perhaps forgot to worry about him; and after some ten weeks we find the boy playing drugstore with his companion. To increase his stock of medicine he brings out the big bottle from which he had been dosed and the following conversation occurs between him and Sam Williams.

"What's all that stuff in there, Penrod," he asked. "What's all that stuff in there looks like grass?"

"It is grass," said Penrod.

"How'd it get there?"

"I stuck it in there," the candid boy replied. "First they had some horrible ole stuff in there like to killed me. But after they got three doses down me, I took the bottle out in the yard and cleaned her all out and pulled a lot o' good ole grass and stuffed her pretty full and poured in a lot of good ole hydrant water on top of it. Then, when they got the next bottle, I did the same way, an—

"It don't look like water," Sam objected.

Penrod laughed a superior laugh.

"Oh, that's nothing," he said, with a slight swagger of young and conscious genius; "of course, I had to slip in and shake her up sometimes, so's they wouldn't notice."

"But what did you put in it to make it look like that?"

Penrod upon the point of replying, happened to glance toward the house. His gaze, lifting, rested a moment upon a window. The head of Mrs. Schofield was framed in that window. She nodded gaily to her son. She could see him plainly, and she thought that he seemed perfectly healthy, and as happy as a boy could be. She was right.

"What *did* you put in it?" Sam insisted.

And probably it was just as well that, though Mrs. Schofield could see her son, the distance was too great for her to hear him.

"Oh, nothin'," Penrod replied; "nothin' but a little good ole mud."

Where the child is unable thus to appeal from parental nervousness to nature's wholesomeness, it is very easy in the

early years to establish undesirable conditioned reflexes by the use of medicines of different kinds, soothing syrups to put the child to sleep, the use of suppositories, and the like.

The problems involved in the care of children may well make one discouraged; but the one rule should be, when we do not know what is best in the education of a child from a hygienic point of view, to let him alone. With our preconceived notions and the stress of convention, even this is a hard thing to do, as hard as it is simple. The feeling of most parents and teachers is that the least they can do in case of a child is to interfere, whether they know what to do or not.

This doctrine of *laissez-faire* for children as regards hygiene is likely to be deemed dangerous, because we are inclined to be omniscient in regard to the best training for children in ordinary matters concerning health and wish to direct them in our own way, but before we use powerful drugs we should at least consult some competent physician who, we may reasonably suppose, does know.

Probably conditioned reflexes, as has been pointed out, can be formed for other glands, perhaps for all the glands with internal secretion. Especially does this seem probable for the adrenal glands. Unfortunately experiments, so far as I am aware, have not been made to show the reaction of these glands to conditioned stimuli. The experiments of Cannon (3, p. 75), however, have shown that while a football game apparently increases the flow of adrenalin, as indicated by the increased amount of sugar in the blood and the like, also the mere watching of the football game by those players who are ready for it, but not participating, has a similar effect. He reports his results as follows:

"Fiske and I examined the urine of twenty-five members of the Harvard University football squad immediately after the final and most exciting contest of the season of 1913, and found sugar in twelve cases. Five of these positive cases were among substitutes not called upon to enter the game. The only excited spectator of the Harvard victory whose urine was examined also had a marked glycosuria, which on the following day had disappeared."

Why may not this be a case of a conditioned reflex? It is possible that if a football team should choose a dog or the like as a mascot, the mere sight of the animal might in the case of some players on the team stimulate the flow of adrenalin. If so, this would be a clearer case of a conditioned reflex; because the sight of the animal would in itself be an indifferent stimulus, and potent only because associated with the original stimuli.

We are dealing here with definite facts. There is no question in regard to the results found by Pavlov. A conditioned stimulus will produce the secretion of the salivary glands in the dog's mouth. Pleasant surroundings increase the flow of the digestive juices in man. We may naturally assume that a conditioned stimulus may also cause the flow of adrenalin. We can see then what probably may happen in concrete cases in our daily activity.

For illustration take the following example. A man is obliged to do some very strenuous work, perhaps work that strongly arouses his emotions, immediately after dinner for several days. The emotional disturbance right after his dinner causes an increased flow of adrenalin, this checks the processes of digestion, and the same thing goes on for several days; and indigestion results. Here the emotional disturbance is the unconditioned stimulus, or in other words the ordinary biologically adequate stimulus. The secretion of adrenalin is the ordinary or unconditioned reflex. Under such conditions conditioned reflexes are likely to be formed.

The man has had this emotional experience while sitting at his desk in his own office. Naturally enough the situation itself, even the customary place at the desk and the familiar surroundings of the office may become associated with the emotional experience, or in other words, become conditioned stimuli. In that case, after the emotionally trying situations have passed, this associated stimulus, the mere sight of the office, may produce the emotional experience; or perhaps the flow of adrenalin as a conditioned reflex. If this be true, then in such a case every time the man sat down at his desk, the sight of the office would stimulate the adrenal glands, cause an increase in the flow of adrenalin, which in turn would check the processes of digestion, and thus the indigestion become chronic. Precisely this seems to be what happens in certain cases; and the best means of cure is to take the man away from his desk for a few weeks.

In the case of a child, of course, the same thing may happen; any situation or any event may become a conditioned stimulus, stimulating the adrenal glands and causing indigestion. Suppose the child, for example, is punished by his teacher immediately after dinner, or merely scolded or laughed at; the emotional experience resulting may cause an increased flow of adrenalin and indirectly stop the processes of digestion, the schoolroom becomes associated with the emotional experience, and then after the days of punishment or of reproof are over the sight of the schoolroom itself may act as a conditioned stimulus

and cause indigestion, until every time the child enters the schoolroom he is affected in this way and as long as he goes to school is the victim of indigestion. If anybody wishes an hygienic moral here, it is not far to seek. A teacher should never punish a child or reprove one severely immediately after a meal, not merely because it is bad for the teacher's digestion, but still more because it is likely to cause the child to have indigestion.

The conditioned reflex is stronger and more permanent when frequently reinforced by the unconditioned stimulus. Inversely the unconditioned reflex may be assumed to be stronger when reinforced by the conditioned stimulus. Thus the dog is likely to show a greater flow of saliva and of the gastric juices if meat is given in familiar surroundings with all the conditioned stimuli that this implies. So too with man, accustomed surroundings become conditioned stimuli and determine a better secretion of the digestive juices. Better digestion results in case of most individuals when agreeable companions are present furnishing conditioned stimuli. And with other individuals solitude may furnish conditioned stimuli that aid digestion. A vast number of accidental and accessory circumstances may become conditioned stimuli—attractive furniture, beautiful dishes, flowers, views from the window, conventional serving, and so on. President Hall (5, p. 335) has put this tersely as follows:

"We eat more or better or both if the dining-room is illuminated and sunshiny, the walls artistically treated, the dishes, knives and forks, table-cloth, napkins, the personnel and attire of the waiter, satisfy us. Color standards are often prescribed for certain foods. So are forms and modes of serving. Flowers, music, song, help."

"People who eat alone, and especially those who cook their own food, are prone to eat less, with less mastication, more rapidly, with less variety, to become careless and irregular. Man is gregarious, and social converse at meals is one of the best of appetizers, while depression and a sense of isolation are keenest to those who are solitary when they eat. A few of these day-dream of imaginary companions and even set chairs for them, while more think of their friends. The health and spirits of a homeless girl who eats alone are in danger, and she is otherwise a pathetic object. Some young women in our returns confessed that they ate better if there were one or more men present, that an enemy, critic, or other objectionable person might wreck a meal, and so might disputation or violent argument. Harmony, wit, humor, help both appetite and digestion, and converse with a friend is best of all."

Many other illustrations of conditioned reflexes that may occur in our ordinary everyday life might be given. The number is, of course, indefinite. Some of these are favorable to the health of the individual, some are unfavorable. Why is it that odors affect some people so seriously, why do certain

apparently relatively indifferent sounds, or slight dermal sensations, a draft of air, or what not, affect some individuals? Why are some individuals affected so seriously by a slight change in the weather or change of location or the like? In regard to many of these things we may find an explanation perhaps from the study of conditioned reflexes.

In regard to any of the conditions of life we may have conditioned reflexes that favor or that retard health; for example, take the weather. Apart from the direct influence of humidity, temperature, stimulation, or what not, perhaps in case of all persons, a group of conditioned reflexes are developed which largely determine the influence of the weather.

Everyone has perhaps his individual reaction to weather conditions. Personally the writer is rather susceptible to climatic changes. Bad weather is apt to cause more or less nervous disturbance, nervous pains and the like, what a few years ago would have been called rheumatism; but in case of a vigorous snowstorm this is largely offset by a distinct exhilaration which comes from watching the storm or being out in it. I am inclined to think this is a conditioned reflex or group of conditioned reflexes developed probably when I was a child and played in the New Hampshire snowdrifts or walked to school in the storm, since fortunately in those days we lacked any no-school bell. At least a pretty definite attitude tinged with pleasing emotion has been developed toward a severe snowstorm.

Everyone has many such conditioned reflexes. To take another personal example, the writer has plenty of unhygienic habits, but one other group of conditioned reflexes developed in early life has been distinctly helpful and is distinctly hygienic, namely, the group of conditioned reflexes produced by the stimuli of a locomotive and a seat in a railway coach. I may start on a journey tired and nervous; but as soon as I am seated in a comfortable car I relax, the throbbing of the engine soothes me, the freedom from care rests me and the motion cheers me. This habit was perhaps acquired when a child. Like most children I was interested in trains of cars, and the like, and a wise mother never allowed me to be frightened by them. It is certainly much more hygienic for an individual to have such reactions on occasion of a journey than to have the dislike or fear of traveling common with many persons.

Hygiene has plenty of wise suggestions in regard to conditioned reflexes; but most men are deaf to her voice. They are more prone to seek the conditioned reflexes developed by drugs or by doctors. Bad as the drug habit is apt to be, the paradox

is true, nevertheless, that the more harmless drugs often have an hygienic effect because they act as conditioned stimuli for healthful conditioned reflexes. Better still is the assurance of the physician that one is in good health, which many of us need periodically.

Children should be trained to healthful habits in regard to all such important matters as eating, sleeping, and the usual activities of life, that is, healthful conditioned reflexes should be developed. For example, as it is more healthful to be social than unsocial, children should develop in connection with eating conditioned reflexes for society rather than for solitude as a conditioned stimulus. And, as Dr. Cannon has pointed out, our companions at table should be agreeable; and meal-time is not the hygienic situation for reproof and punishment.

If there were time to consider the inhibition of conditioned reflexes, the significance of all this for hygiene would be made still more emphatic. Pavlov, as we have seen, finds that almost any thing whatever, a slight stimulus of almost any kind, is sufficient to inhibit a conditioned reflex. The same we may naturally suppose is true of the conditioned reflexes developed by the stimuli in our everyday environment. To take a concrete case; an individual rises in the morning on a pleasant day, all the favorable stimuli of sunshine, fresh air and one's bath, the conditioned stimuli of an attractive breakfast and pleasant companions and the like, tend to favor appetite and digestion and put one in a condition of well being or euphoria for the day's work. But if bad news, or the slightest domestic friction, or the like, occurs, these favorable reflexes may be inhibited and the individual goes to his daily work handicapped from the start. It has now been shown, if I mistake not, that many of the accidents that occur in industry can be traced pretty directly to some domestic trouble that occurred in the man's home, putting him in a condition unfavorable for his daily task. This opens up a wide and significant field in mental hygiene; but no special investigations have been made here, and this must be passed over.

Pavlov found that a great number of the most different influences can act to cause an arrest of the conditioned reflex. Frequent repetition will also remove this arrest or make it tend to disappear. The process reduced to its simplest terms illustrates how it comes to pass that we no longer perceive disturbances which threaten to hinder us, by developing the orientation or attitude reflexes. Pavlov includes under arrests also the case when the conditioned reflex disappears because it is no longer repeated in connection with the unconditioned reflex, that is, his so-called conditioned arrest. He refers to

further results according to which even this arrest may again be inhibited by a new stimulus, perhaps the flaring up of a lamp, so that therefore the conditioned reflex may again appear; all this may throw light on the experience that an unexpected stimulus, a shock, for example, may suddenly revive a habit supposed to be conquered.

All the passive reflexes are important for the health of the individual and a good part of mental training consists in acquiring such reflexes. All this means adaptation to the conditions by which one is surrounded. Education shows us the importance of noting and registering facts in regard to objects about us. It shows us the importance of giving attention. Hygiene, on the other hand, shows that it is just as important to learn to ignore unessential sensations and impressions as it is to give attention to the essential.

LEARNING AND THE CONDITIONED REFLEX

In all the processes of learning we have long known that the law of association is the fundamental psychological law. The study of the conditioned reflexes has shown that this law of association is more fundamental and far reaching in education than even the association psychologists had supposed, because stimuli not consciously perceived become associated and conditioned reflexes formed. The old view that everything in human acquisition is made up of reflexes and complex reflexes is seen to be far too simple, and now we have to study not only these but conditioned reflexes as well; and the number of conditioned reflexes developed in the course of education may be quite as great as that of the simple reflexes.

The significant thing is that the child at birth has one of these mechanisms, namely, that of the ordinary reflexes, and does not have the other. The child possesses, however vast potentiality for the acquisition of such conditioned reflexes. This gives it its great capacity for learning. And it should be noted that real learning, in distinction from the mere performance of activities for which the neural mechanism is congenital, consists in the acquisition of such conditioned reflexes. Hough (7) has put this very fittingly in making the contrast between such acquisition as what we call learning to walk and real learning, as in learning to talk. In the one case, the mechanism for walking is probably innate in the child as well as in an animal like the colt. The child cannot walk at birth because the neural mechanism which functions walking is not yet fully developed: but there seems good reason to believe that as soon as this neural mechanism is developed, as

indicated by such studies as those of Kirkpatrick, the child walks without any real learning.

It is very different with such acquisitions as that of learning to talk. There may be an inherited mechanism, and undoubtedly is, for making articulate sounds; but the learning to speak a particular language is the case of the acquisition of a vast number of conditioned reflexes.

There are, thus we see, three kinds of learning. first, is the acquisition of those reactions for which the apparatus is congenital and inherited, such activities as learning to walk, the normal reaction of the fundamental organs of the body, suckling, chewing, secretion, and the like. Although we speak of learning to walk and the like, strictly this is not learning at all, but merely the putting into action of these congenital mechanisms which the individual inherits readymade, or which are partly developed at birth and complete their development with normal growth afterward. All these, however, are tremendously important for the health of the individual.

Second, is the form of learning which consists in the acquisition of temporary associations, the temporary conditioned reflexes. A great part of the learning consists of this kind, the associations are formed merely for a temporary purpose, and are normally soon broken down to give place for others.

As Krasnogorski has pointed out, we must then look upon the brain of the normal child as a place where temporary associations and temporary centers of association, are continually being formed and continually breaking down to be replaced by new ones, and we must infer that it is only the general result of all this activity, not usually the particular form of it, that persists and constitutes the general permanent training of the individual. All these acquisitions, however, are important for the general development and character of the individual, leaving probably even when broken down a residuum of character which may be important in determining the generic attitudes and habits of the individual.

Third, is that form of learning which consists in permanent acquisitions. Such permanent associations or habits may be acquired in two ways; first, by many repetitions of the association until the paths become permanently organized; and second, by a single intense initial reaction, or by shock, as we may say. The most important parts of our learning consist of these permanent acquisitions.

There is a significant difference between the temporary associations, temporarily organized conditioned reflexes, and permanent associations. What the difference is in the mode of acquisition which makes one temporary and another permanent

we do not adequately know. Why, for example, should most of the associations and conditioned reflexes that the child forms fade out in a short time if not repeated, and why, on the other hand, should a remarkable sight or the odor of the smoke of a locomotive or a factory or the perfume of a flower bring back after many years the memory of some definite scene and experience in childhood. Or why, again, should a single association of two events or two objects, remain so permanently impressed upon consciousness that no effort can eradicate the memory. The answer to these questions we cannot give, but the difference seems to be largely in the intensity of the initial reaction. A single intense nervous discharge apparently marks out a permanent path in the nervous substance which may be more permanent than that formed by many repetitions of responses of less intensity.

We come here upon some of the most fundamental problems of mental hygiene and of pedagogy. And we see here some of the aims of education from the hygienic point of view, among them the following:

First, the aim of education from the hygienic point of view is to enable the child's organism to acquire those fundamental organic reflexes necessary for normal health and development. For this end it is necessary in the early years that the child be protected from injurious conditions and that opportunity be given for the apparatus necessary for all such activities as the normal movement of the limbs, such as walking, and the normal reflexes of the digestive and secretory apparatus, the normal reflexes of the eye, and the like, to develop. In most cases all that is necessary is to let the child alone and protect from injurious influences.

The second aim of hygienic pedagogy is the acquisition of conditioned reflexes, or habits, if you prefer, essential for health. That is, the child in the early years should acquire those habits which represent the alphabets of normal healthful activity both physical and mental.

The third aim of education from the hygienic point of view is the retention and preservation, so far as possible, of that plasticity of the nervous substance which makes possible not only the acquisition of conditioned reflexes, but also the breaking down of such reflexes, and the acquisition of new and perhaps more important ones. This apparently makes all the difference between the possibility of indefinite growth and that arrest of development which we call feeble-mindedness if it occurs below the stage of normal development for the age of 15 or 16, and dementia praecox, senescence, or the like, if it occurs after that.

The greatest of all differences between individuals is the difference in that subtle inherent character which gives an individual the power for form, to hold, and to break down associations. This is what indicates the learning capacity of the individual in the larger sense of the word, this signifies the individual's capacity for growth and development, or, on the other hand, his susceptibility to arrest of development, feeble-mindedness, or senescence, as one may please to call it.

The bearing of all this upon the concrete problems of school hygiene as well as mental hygiene is probably significant, although we may know little about the whole matter. A few studies already made indicate that in examinations in any of the school activities conditioned reflexes important for health are likely to be formed, for example:

"Of thirty-four second-year medical students tested, one had sugar before the examination as well as afterwards. Of the remaining thirty-three, six, or 18 per cent, had small but unmistakable traces of sugar in the urine passed directly following the ordeal. A similar study was made on second-year students at a women's college. Of thirty-six students who had no sugar in the urine on the day before, six, or 17 per cent, eliminated sugar with the urine passed immediately after the examination." (3, p. 76.)

As regards the higher mental processes, the conditioned stimuli often become a very important condition of thinking. An interesting illustration of this is shown in the experiences of many students. One student reports, for example, that in order to study effectively she must very carefully prepare her toilet and can go to work effectively only after doing this. In the study made by Jones many authors and distinguished men reported that they did their thinking and writing in very peculiar postures. The advantage of this was not purely physical, but the posture was probably to a certain degree a conditioned stimulus producing a conditioned reflex.

It has been reported that certain distinguished men have required certain peculiar stimuli as conditions of intellectual work, varying from the beating of a kettle drum resorted to by one English writer, to the habit of working under the pelted rays of the sun, a habit attributed to Byron, if I mistake not. Such experiences as well as that of the ordinary writer who to do his best work feels the need of his favorite desk, or den, are probably due in part to the conditioned reflexes developed.

That children are likely to acquire the dependence on such conditioned stimuli is, I think, a matter of almost everyday observation. Sir Walter Scott reported that when he was a

boy a schoolmate always stood above him in the spelling class until having noticed that his schoolmate on occasion of a difficult word always fumbled a certain button on his waistcoat, he surreptitiously removed the button, as the story goes, and at the next recitation the boy lacking the ordinary stimulus was unable to spell his word and was displaced by Sir Walter.

The number of things which in case of children and adults as well may become conditioned stimuli for thinking are innumerable,—one's accustomed posture, one's favorite chair, the surroundings of one's study, with many men the inevitable cigar, with some the favorite pen, or even the click of the typewriter, and with others the comforting sensation of the hand in the trousers pocket. Of course some of these are more than mere conditioned stimuli, but in a very important sense it does not seem straining the point to speak of them as conditioned stimuli of our thinking. That scratching the head furnishes a stimulus to thought has become proverbial; but anything whatever may become a conditioned stimulus.

Finally, the whole aim of the school is largely the development of conditioned reflexes, and the work and discipline and surroundings of the school all tend to develop conditioned reflexes favorable for mental work. Thus it comes to pass that children can usually study far better with other children, with the familiar surroundings of the school room, with the presence of the teacher; and even the furniture and adornment of the schoolroom, the posture of the pupils, and the like, all favor the work to be done if the school is rightly organized.

On the other hand, with anything whatever in connection with the school unfortunate and unwholesome conditioned reflexes may be formed. An unfortunate circumstance in discipline or instruction, or an unfortunate method, or a poor textbook, or what not, may arouse conditioned reflexes which mean confusion and repugnance to the given subject. Again in connection with one or more of the pupils an unfortunate circumstance may develop a conditioned reflex of sub-acute rage or fear or the like, so that whenever that individual is seen this unfortunate and unwholesome reflex has its detrimental effect. Even in connection with objects in the schoolroom, anything whatever, such unfortunate reflexes may be formed.

Unfortunately it frequently happens that in connection with the teacher unfortunate conditioned reflexes are formed. Any injustice or cruelty or sarcasm on the part of the teacher may arouse emotions of rage or fear in the pupil, which naturally are suppressed; and then afterwards the sight of the teacher or the sound of the teacher's voice may always act as a conditioned stimulus, bringing up a sub-acute emotion of rage

or fear. All this is usually distinctly unfortunate and unhygienic; and it may not be strange if in many cases indigestion, nervous prostration, or the like, may be developed simply as a result of these conditioned reflexes connected with the careless teacher who has shown injustice or cruelty.

Still more serious results sometimes occur where apparently an unjust teacher becomes a conditioned stimulus that inhibits the pupil's will. Meumann (13) has reported the following case:

A child that he knew entered a new school. His former teacher, who had an antipathy towards the thirteen-year-old boy, introduced him to the new teacher in a tactless manner and blamed the pupil. From this moment the boy, who had been distinguished up to this time, could do nothing more. Not only did his intellectual performance decline from day to day, but his attention and behavior became bad, his affective life became shy and depressed, at the end of the term he was not promoted; in a word, the boy would have gone to pieces if his parents had not taken him away from the school. In the new school the teacher treated him trustfully, and from this moment on the boy was transformed in all his activity; became obedient, had excellent marks, and left the school as one of the best pupils.

This case with will inhibited by the injustice of an unwise teacher and therefore unable to do anything, is apparently a case in point. The sight of his unjust teacher, and the sound of his teacher's voice, always aroused a conditioned reflex which inhibited the normal mental activity of the pupil. We do not need to evoke any transcendental power of the will or the like, it is even more natural to consider that the unfortunate result came from such unwholesome conditioned reflexes and the fact that the child's will was not strong enough to overcome them. And good evidence that this is the correct interpretation is furnished by the fact that removal of the boy to another school at once restored his ability to do good work.

Watson (17) has pointed out the other side of all this and called attention to the fact that the conditioned reflexes connected with the emotions of rage or fear or love may act distinctly as a help and a stimulus to the individual enabling him to do more and better work. Undoubtedly in case of the emotion of love this is often the fact, and it may be true in case of the other emotions:

"As we look back upon our school life," says Watson, "we are convinced that those teachers, both men and women, for whom we have had strong attachments have been the ones from whom we have received lasting benefits. Nor is the case very different with the other two emotions. A teacher who has

on occasion a sharp and caustic tongue can by the use of it induce a modified rage response in his pupils which may be extremely useful in raising the level of achievement of the class. Likewise the teacher who can and at times does induce the fear reactions becomes a powerful factor in the lives of his pupils."

Watson is probably quite right in regard to the influence of many teachers. More commonly, however, it may be feared that the effect of the teacher's sharp words is to cause an inhibition of the pupil's will which often brings it about that the teacher furnishes a conditioned stimulus which inhibits the pupil's activity whenever work is attempted.

Thus we see that a child's education consists largely in the development of conditioned reflexes. These are important both for the physical and mental health of the child. So complex is the whole problem, and we know so little, that the task is a difficult one. To give attention properly to such hygienic education is about all one can do in the early years; but on this the emphasis should be placed.

THE COMPLEXITY OF THE PROBLEM

The significance of the conditioned reflex is that it furnishes an objective method of studying the development and function of the cerebral cortex. Pavlov's discovery that any sensation from any receptor organ may become associated with the original or biologically adequate stimulus and produce the same reaction, furnishes a possible explanation of many unusual and bizarre phenomena of human behavior without resorting to mystical or transcendental hypotheses. It promises a method by which it may be possible to study objectively not only many pathological phenomena, as suggested by Watson and Heilbrunner, but many of the phenomena that have been the subject matter of various fads and theories in regard to mental hygiene and the like. The infinite number of possible stimuli that may become associated with the original stimuli and the vast complexity of anything which deals with human behavior, make the study of concrete cases extremely difficult, although distinctly promising.

Of the motor reactions of the animal to the constantly changing stimuli of the environment Mlle. Dontchef-Dezeuze says:

"Constantly at each minute we may say during the experiments positive active reaction appears with each change of the environment. Each sound, however feeble, supervenes between the constant sounds and noises which surround the animal. Each decrease or increase of these constant sounds, each variation of the intensity of the general illumination, whether the sun is concealed by clouds or a ray of light traverses

them, each subtle increase or decrease of the light of an electric lamp, a shadow which crosses the window, each new odor diffused, a whiff of hot or cold air which reaches the animal, even the slightest caressing of the skin excites the activity of such or such a part of the animal's muscular system. The eyelids, the eyes, the ears, the nostrils, are put in movement. The head, the trunk, and the other parts of the body, are moved or placed in such or such a position, while these movements sometimes are repeated and augmented or sometimes the animal places himself in a definite posture."

When we reflect that the child is quite as sensitive to stimuli as the animal and forms conditioned reflexes even more readily, and that what is true of the impressions from external stimuli is probably true also in greater or less degree of mental impressions, we get a glimpse of the vastness and complexity of the problem of the conditioned reflex in relation to education and hygiene. In the view of Dontchef-Dezeuze, what is true of an auditory stimulus associated with the feeding of a dog is true also for the impression received from any receptor organ. It does not matter what the stimulus is, it may be visual, olfactive, auditory, tactile, thermal, or probably even organic. If such an indifferent stimulus of any modality whatever is associated with the ordinary stimulus it becomes an active agent determining the secretion of saliva. It is only necessary that the indifferent stimulus be presented simultaneously with the ordinary stimulus so that it may become associated with the latter.

If an entirely indifferent stimulus like the mere sound of a bell, or the striking of a certain note can call forth a definite physical reaction like the secretion of a gland, we may well imagine that any mental image or idea and even any attitude or *Einstellung* may in like manner be associated with the ordinary stimulus, become a conditioned stimulus, and call forth a definite physical reaction of a gland or a motor organ. Thus we can see why an individual's mental processes and the various associations formed with a situation or any form of activity may be so significant for the health. The ordinary teaching in regard to mental hygiene is largely vague and indefinite, but this method of approach from the study of the conditioned reflex shows a solid objective foundation for some of the generally accepted doctrines in regard to the effect of the mind upon the body.

The student, however, should remember that the law of association both in its application to mental states and conditioned stimuli is merely a general law, and perforce gives a mere method of approach. Human experience is also infinitely complex on its qualitative side. In studying any concrete case the problem is always an individual one. It is the task of the psychologist to analyze the mental states in question and the

processes involved, and hygiene must often wait for this work of psychology.

The writer may be all wrong in some of the concrete examples given, but the general principles and method suggested are sound. And if the illustrations used suggest a claim to a vast field, it would be far from the writer's intention to suggest that mental hygiene could dispense with the help of psychology and pedagogy. He is well aware that the law of association, even as it appears in the conditioned reflex, bakes us no bread; but it does give an objective method of study of the first importance, and the possibility of its application is obvious when one reflects that not merely the sensation from any receptor organ, but also ideas and probably mental attitudes and affective states as well may be associated with the biologically adequate stimuli as potent factors in the production of conditioned reflexes.

SUMMARY

1. As regards conditioned reflexes we have to note especially the ease with which they are formed in the child and the ease with which they are broken down. This indicates probably that the path of association is established in the gray matter of the cortex.

2. They are not to be identified with ordinary reflexes. They form a group by themselves. The essential thing about them is, as expressed by Hough, "that the connection between afferent and efferent fibres is a path blazed through the nervous substance rather than a definite localized conduction through specialized neurones." (7 p. 411.)

3. Any receptor organ apparently may furnish a conditioned stimulus. In other words, any impression whatever from any receptor organ may become associated with the ordinary unconditioned or biologically adequate stimulus and produce the same result.

4. Theoretically for any motor organ or perhaps any gland one may develop a conditioned reflex.

5. The conditioned reflex is stronger if frequently re-enforced by association with the unconditioned stimulus.

6. The unconditioned reflex in many cases is made stronger by re-enforcement from a conditioned stimulus.

7. In some cases apparently, the ordinary or the unconditioned reflex will not occur unless re-enforced by a conditioned reflex.

8. Many pathological reactions, hysterias, and tics, and the like, are conditioned reflexes.

9. The conditioned reflex may be used as a method to determine a defect of a sensory organ.

10. Education consists largely in the formation of conditioned reflexes.

11. Conditioned reflexes are especially important from the hygienic point of view, some being favorable to health, others unfavorable.

12. Many habits are conditioned reflexes in the initial stage of their development, but the word habit is a loose generic term used to cover all forms of acquired reactions or tendencies to react that are permanent.

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REFLECTIONS OF AN IMMATURE INTRO- SPECTIONIST

By H. C. GRUMBINE, Clark University

The habit of introspection is not conducive to contentment, however valuable it may be to the psychologist. It brings the self into closer touch with the self; and what the self would seem, on most occasions, to desire is not a first-hand acquaintance with self but a view of self's reflection in the mirror of one's fellow beings. It is what they think of us that gives value to ourselves. And, lacking the looking-glass which others' eyes hold up to us, we turn, more or less naturally, to some clear pool for communion with our own image. Even amid the throng on the sidewalk we do not disdain to halt a moment to study, in the polish of some shop-window, the tilt of our hat, the shapeliness of our ankle, the hang of our skirt, the contour of our bust. We are dualists by nature. We run away from ourselves in the loneliness of our rooms to greet others for their companionship; and when we find it, we inwardly praise or condemn them according as we see or do not see in them the duplicate of ourselves. What is not kin to us, we turn away from as unpleasing if not abhorrent. We love them for having something in common with ourselves; we blame them for disagreeing with ourselves. We like to cultivate not a first-hand acquaintance with ourselves but an acquaintance with our reflections. We desire not introspection but what—if it were permissible—might be termed *extraspection*.

In the family-circle the case is much the same. Before the circle has expanded to embrace units other than the parents, the wedded couple are each fond of believing the source of their happiness to lie in their differences. Brunette likes blonde. Blue eyes love dark. A nose *retroussé* prefers an aquiline beak. A downy chin adores a military whisker. A sanguine temperament delights in the mysteries of melancholy in the beloved. And so on, through the categories of the differences, which when paired, unite into oneness and harmony. Sometimes the attraction of opposites has been so extreme as to bring and hold together individuals of different races: the negro and the white; the Gaul and the Teuton;

the Oriental and the Occidental. This magnetism exerts itself not only through the physical self; there is given it a yet wider demesne for its operation in the mental, the psychical, the spiritual, and in whatever other phases of character are not comprised primarily in form and feature; in color of hair, eye, and skin; in movement and habit of body. Yet the contrasts that delight become a source of discord, the opposites that attract are charged with the dynamic of repulsion, the instant the mystery of attraction is removed. And that attraction is what? It is the power Eve has of showing Adam in herself a reflection of his strength; it is the power Adam possesses of whetting Eve's appetite for the sweetness of her charms. It is with ever renewing pleasure that she braids her hair in the mirror because of the halo of approval he has placed there. It is with increasing satisfaction that he fares forth into the environs of Eden for flesh and fruit and figleaf because of her applauding smile when he lays these bounties at her feet. Matrimony, companionship, social intercourse are refractive media that separate for the eye of self the white light of selfhood into the seven rainbow colors of which selfhood is composed.

Probably this side of the thesis has been given sufficient excogitation for a return to the assertion that introspection is not an agreeable operation. Certainly it is not pleasant at first. Perhaps a taste for it may be acquired, like a taste for olives, or caviar, or beer, or tobacco. Yet—and there would seem to be a negative to every positive—there are some persons born with a natural relish for it as there are some who take to olives or tobacco as a duck takes to water or a bird to the air. For them the act of looking inward is not a perversion. It is a source, sometimes of amusement, sometimes of profit, sometimes of melancholy: the amusement or profit which consists—to borrow Richard Burton's quaint phrase—in the 'anatomy of melancholy;' in, it may be, the physiology of the body, the dissection of a muscle, the paring of a toe-nail, the probing of a sore; in the vivisection of an emotion, the reaction to a kiss, the shock of an insult, the birth of an idea, the parturition of an enthusiasm; in short, in the contemplation of the innumerable unnamed experiences of the soul in its contact with life. It is for most eyes a strain to turn inward; and, when they accomplish the feat, they see only darkness. It is for most hands monstrous to prick their own skins; and when they do so, they tremble at the feel of their own blood.

Perhaps the least profitable exercise in which a healthy mind can indulge is to probe into its inner recesses for the purpose of discovering, if may be, the principles of its mechan-

ism or the laws of its operation. If this is not true on all counts, it would seem to be so on the score of health and comfort. I remember quite vividly an experience of mine some years ago with my physician. I called to consult him about what I took to be my disordered liver. I described my symptoms in answer to his queries; and the final, comprehensive, and clinching interrogatory I was obliged to answer was where I thought my liver was. I placed my hand on the offending region and was much surprised to be told this: "My good fellow, your trouble is not seated in your liver. Patients with derangement of the liver always have sure knowledge of the location of that organ. The liver so unmistakably asserts its presence to them that they not only know they have it but they know where they have it. It cries out loudly and persistently. It domineers over every other member of the body, which all point at it as at an incorrigible offender. And all of its importance is due to the fact that it is sick. It invites attention to itself. It wants to be taken out and cajoled and petted and purged. It is like a baby crying for paregoric."

So said the Doctor of Physic. And his voice comes to me across the years as I sit here trying to put on paper a notation of the things that pass through and possess my soul: my thoughts, my feelings; my miseries, my joys; my despondency, my elation; my mood, my disquietude; my reaction to the stimuli of sense, of food and drink, of companionship and solitude. Is the parallel valid? If, by my lack of knowledge as to the location of my liver, I convinced an honest doctor of my immunity from liver-complaint; could I now, by an all-too-overwhelming consciousness of a pressure upon my soul, convince an alienist of some hypertrophy or enlargement or softening or other deep-seated derangement of the mind? Perhaps so. Perhaps, too, the poet Wordsworth was not wholly wrong in his quaint theory of psychic health that, as the child becomes a man, he develops—along with the other diseases of adolescence—the climacteric distemper of self-consciousness: an affection of the soul which closes in upon him and shuts him out from the kingdom of Heaven whence he came as prison-doors shut in a convict and separate him from the sunlit freedom that formerly was his. How well the prisoner knows that he exists. How much better now than when he roamed the windswept hills can he say, "I think, therefore I am!" Would some wise Doctor of the Soul—would Wordsworth—say to him: "It is precisely to the degree in which you feel the burden of thought weigh upon you that you are ill. The stress of consciousness is the symptom of our disease. You are sick of civilization and education and

learning and logic and analysis and cogitation and—psychology. Eureka! Psychologitis! There is only one thing that will cure you. It is a severe regimen, but it is your last hope: You must, instead of standing and walking erect, go on all fours. And whenever you are prompted to go at anything with the full force and weight of your understanding, you must never yield to the impulse in the old way, but you must approach the matter with your head inverted and your eyes directed upon it through the angle made by your lower extremities!"

This is something of what Hamlet may have meant by his phrase 'sicklied o'er with the pale cast of thought,' and yet Hamlet only adumbrates upon the idea; for while his self-analysis was pre-eminently introspective, it was introspective in respect of a given situation and not in respect of any and all situations that happened to evolve out of the kaleidoscope of events. Hamlet might be termed an expert psychological introspectionist, had he, instead of bothering so passionately about his uncle, his mother, Polonius, and Ophelia, and Laertes,—had he simply sat down with, say, a stop-watch in hand, or some other instrument devised for the compilation of statistics, and kept careful tab on the stream of ideas pouring like a mill-race through his consciousness; had he studied the groundswell, the storm, the ebb, the flow, of his emotions: their character, their strength, their correlation, their concatenation, their causation, occasion, and origin. Thus he should have discovered himself not sicklied o'er with the pale cast of thought but aglow with the rapture of a new discovery in the new psychology; for he should have known that the business of the introspective statistician is not so much to think or to feel as to see how thinking is done and how feeling is achieved. Probably his main objective in dispatching Polonius with a sword through the arras would have been to note the initial quickening, the final flickering and cessation of his own as well as Polonius's pulse-rate, together with perhaps a momentary increase followed by a decline in the peripheral circulation both of himself and his victim. In his final unequal passage at arms with Laertes, he would have been more than commonly interested in the effects of poison not so much upon Laertes as upon himself; its effects upon his own senses and motor-activities; the palsy that crept into his arm, the pictures that projected themselves through his eyes, the dryness of his tongue, the clutch at his heart, before the last spasm of agony sent him lifeless to the floor; and a hundred or more unimaginable experiences, which he alone, in his capacity of introspectionist, could have discovered. In a word, if he was mad, he

would have told the world explicitly that he was so. He would have done more: he would have made a minute—perhaps a meticulous—exposition of why and how he came to be mad and how it felt to him to be so. The carping critic should not cavil at the impossibility of a madman comporting himself like a professional introspectionist; for, as he himself said to Horatio, there are more things in Heaven and earth than a sane man's philosophy—like Horatio's, of course—dreams of. Perhaps, finally, he *was* a professional introspectionist to the limit of his capacity—deprived as he was of the machinery of the psychological laboratory; if so, the fact yet remains to be exploited before a scientific public, and the question of his sanity to be adjudicated from a new angle.

Now, if this could be done for Hamlet, it would be fruitful of a few results of importance: first, it would, in all probability, solve once for all a few vexed literary problems; second, it would, with considerable certainty, make the path of the non-professional introspectionist a little easier to go in. For the achievement would have to be gained without the use of the scientific instruments now employed in the laboratory, as there is nothing now left of Hamlet to weigh or to measure except his ghost or as much of it as has not repaired to that bourn from which no traveler returns; yet that remnant, a considerable one, fortunately, is forever embalmed in the immortal lines he once addressed to those who chanced his way at a time when everything was so rotten in Denmark. Would anyone now, when the scientific spirit has come to dominate thinking, have the hardihood to employ a method of introspection unaided by mechanical devices and uninspired by the desire to plot a series of curves? Hardly; for, in the first place, he would at the outset have to deny that his thinking is thinking; he would have to make the denial on the ground that it is not cerebration; and, in the second place, he would have to assert that his introspection is more than looking inward; for he would have to admit that it is hearing and touching and tasting and smelling inwardly; that, moreover, it is sensing with the deepseated muscles, the bones, their marrow, and with the viscera—the lungs, the heart, the bowels—of the body; that, in addition, it is plumbing the depth of moods such as the doldrums and the mulligrubs; that it is scaling the heights of ecstasies and raptures: that it is, for illustration, soaring into the darker outlying reaches of the soul whence Poe's raven came to perch upon a bust of Pallas; that it is to voyage with Shakespeare from Heaven to earth and from earth to Heaven to give to airy nothing a local habitation and a name, and, after having completed the voyage,

to out-Shakespeare Shakespeare by showing how Shakespeare dit it. Nor would the thorough-going introspectionist remain content herewith. He would aspire to demonstrate by what stages and flights and processes and calculations and measurements and tabulations he acquired possession of his knowledge. He would like to know not only how the egg was hatched and laid and fertilized, how it grew into a chick and then into a hen, but how the primal protoplasm was fertilized and grew into countless forms of life, each with its ghost of soul like to and yet different from the unnamable other ghosts of souls that animate the living clay known as animal life. For through such vast and far-reaching vistas as these even Poe's raven may be supposed to have flown to deliver with more wisdom than a passing glance can discern or even the sciences can disclose, his sepulchral 'Nevermore.'

What, then, can I do with my poor self as I sit here contemplating it? Am I to stop sitting and contemplating, and make the decision on the ground of its unloveliness? Am I to take the stand so often assumed by critics that self-contemplation is a morbid act? What, in that case, is to be made of the well-known advice. 'To thine own self be true, thou canst not then be false to any man'? Or of the still older maxim, 'Know thyself'? Plainly, the precept of altruism has its origin in egotism; and perhaps just as surely it has its end there. For good or ill, every man has a self to cultivate and keep; and when he comes to the point of saying to himself, 'To be or not to be,' he proposes a departure from others no less than from himself. No, the confirmed introspectionist entertains the purpose of serving society by ascertaining—as far as may be—who and what he is and why he is what he is. If his method is wrong, he is not to be relieved of the merit of good intentions. He means well. He is tired of looking into a pool. He is weary of studying his reflection from those who approve or disapprove his appearance and acts. He reads history, ethics, philosophy, religion, and finds there a world of shadows—a criss-cross of reflections against the world from some man or group of men to whom and whose deeds the world has reacted. He would start forward on a new tack.

So he turns his attention self-ward. He does it quietly and calmly. He ensconces himself in his cushioned chair with his feet propped on the back of another chair. It is the easiest attitude he can assume: the attitude most favorable to the free flow of the soul he essays to capture and caress.

It is a chill rainy morning in early September; and that

accounts for the sensation of iciness in the feet and of goose-flesh along his calves, with a succession of spiral shivers originating in the nape of his neck, touching his loins, and huddling in the crevices between his toes. He notes on the fist holding his pencil that the shadows between the knuckles are blue and that the pink of the finger-nails is fading into the same color. He asks himself: Is this myself? Are these hands and feet my hands and feet? Is this gooseflesh my gooseflesh? Or are these members, however much I may esteem them mine, yet alien to myself? Perhaps these are the mere possessions of self, and no more my real being than the breakfast in my stomach or the coin in my pocket. If Tennyson was as much of an introspectionist as he was a poet, he yet, apparently, went as far as he could go when he wrote: 'Closer than breathing, nearer than hands and feet.' I might lose a hand or a foot. In that case should I be any the less myself? It has been said that, years after a foot has been amputated, one may feel, where the member once was, certain sensations as if it were still there. This phenomenon of the severed foot would seem to attest its intimacy to, its inseparability from, its identity with, the self. On the other hand, the fact that I can contemplate it as a thing apart would seem to demonstrate not only its detachability but its essential detachment or separateness. Probably this is one aspect of the duality of my nature.

Morning has passed into high noon, and with it has gone something of its chill. Self, meanwhile, has removed its feet from the chair that supported them, and betaken itself to its hotel for dinner. This self belongs to that stratum of provincial society that takes its dinner in the middle of the day and reserves its lunch for the evening. This is partially a matter of choice; and the choice rests upon the experience that the process of digestion is, on the whole, pleasanter in the afternoon than in the early hours of the night. This self has more satisfaction in a quiet hour or two on a full stomach after the sun has passed the meridian than in a distressed period of protracted length on a gorged maw after nightfall. This may be due to the assertion of atavistic habit: that habit in the ancestral ape who sought his meals and consumed them in the glow of the sun rather than in the gleam of moonlight. If this be true, the self has made an interesting guess; of course, he has no assurance of the validity of his guess. Yet the roast lamb that is in him, together with a boiled potato, a quantity of succotash, and a piece of applepie, minister to his comfort as efficaciously as if he were possessed of complete certitude in this matter. He may owe a good deal of

his attitude of *laissez-faire* to the gentle stimulus of the iced tea he had for a beverage. His mood is one of contentment. He does not like to turn his eyes toward the glare of the sun in his western window. Nothing of the outside world is now of any importance. He prefers to let his eyelids droop and, folding his hands over his heart, allow that organ and the other organs co-operative with it, free rein in the exercise of their single and confederate functions. He can hear the corpuscles sing as they crowd merrily to the uttermost regions of his body, bearing each its precious burden of nutriment for bone and sinew and nerve and tissue, as the bee carries to the hive its freight of honey for the honeycomb.

After a while there ensued a wave of feeling that threatened to plunge the self into the abyss of the doldrums; and bethinking himself of the imminence of this danger, the self repaired with a companion to a haunt dear to them because removed by nine flights of stairs—by actual count of the stops the elevator may be called upon to make on the way up—from the madding crowd of the thoroughfare. They asked for nothing much and for nothing very expensive. The article served was beer; and it was drunk without anything to eat, in order that it might exert its peculiar effect unneutralized by food. The self acted in the interests of introspection; and the self's companion said she wanted nothing to eat because she did not care to spoil her supper, and because, moreover, in the matter of expenditures she has gradually acquired the habit of graceful acquiescence. After the first glass, which was rather bitter to the taste and which induced a momentary sensation of revulsion, there speedily came a sense of lightness, yes of airiness, as of one resting on a downy cushion; a sense of expansiveness as of inner doors opening and barriers vanishing and walls silently melting away. It was not exhilaration, for there was no ascent into higher regions. It was rather a sinking; and yet it was not that either, for all the environment remained the same. It was somewhat akin to an effortless floating upon the salt billow. It was freedom. It was as if inner rooms long locked against intrusion were being unbolted under the compelling command of an 'Open Sesame,' and all the closed windows of privacy were suddenly flung open to the sun-sifted zephyrs of cloudland. It was a sweeping of hidden corners. It was a brushing away of cobwebs. The pulse quickened. The air tasted cool in the nostrils and the inmost recesses of the lungs; and the eye roamed with rapture over inner uplands where the dews of morning refreshed the grass and the feet of delight skimmed like an electric launch over pools made by clear mountain-springs and glowed to the sweet

sting of their spray. It was as when a man loosens his girdle, casts off his vestments and goes forth with outstretched arms to greet the new day. It was inner nakedness.

It is now several hours since this adventure of the soul, and the shades of the prisonhouse have again settled down to shut out that fictitious heaven. Yet there is no craving for any more of the stimulant—not at present. Nor is there a feeling of shame at puritanical traditions violated; nor yet of disgust for having yielded to a plebeian impulse. There is no vision of a warning finger pointing at a signboard on the shore of Avernus with the inscription, 'That way danger lies.' Rather there is a recollection of a saying attributed to the sainted Lincoln and something to this effect: 'The Lord must love the common people for he made so many of them.' True, it is a perversion of his words to make them read, 'The Lord must love intoxicating drink, for he made so much of it,' and the obvious retort would be some forcible reference of drink to the Devil, with some such scriptural embellishment as, 'Wine is a mocker and strong drink is raging.' The introspectionist has little concern with morals as a bone to gnaw. What he is after is every possible reaction of the psyche to every imaginable experience of life as it is lived, and all is grist that comes to his mill . . . There is no headache; the hand does not tremble; there is no nausea, no unwonted thirst for water; no such desecration of the spirit as calls in its remorse upon the Father of Mercies for pardon and purging. The light from the electric table-lamp lies, as before, upon the old familiar objects, each of which starts an endless train of memories; and the psyche is as inscrutable, as hidden, as mysterious as ever.

Yes, almost as inscrutable as when consciousness takes flight and the curtain of sleep descends upon the senses and wipes out their impressions, is the mystery of the soul. The self remembers perfectly well this morning, and with the distinctness of a present occurrence, the process of preparing for bed and the act of falling asleep. As the gong-like noise of a clock striking the hour in an adjoining room announced the approach of midnight, vague questionings obtruded themselves upon the attention: questionings about the past and its futility; fears about the future and its purpose; a wish to let go of everything past, present, and to come, and to renounce all responsibility even for the change in my pockets and the few possessions placed here and there in the room. Forgetfulness, nothingness—that was the dominating desideratum. Let Destiny have her way? No, rather let Destiny stop pestering me. I would have done with her forever. Not

that Destiny has been unkind, nor that she mightn't be kinder; but that, on the whole, she has been a coy minx—skittish, moody, perverse, bent upon being cajoled and coaxed and courted. Let Destiny and Opportunity and Foresight and the rest of that brood go to the Devil and let me alone with Chaos, Oblivion, Annihilation. A twinge, perhaps of neuralgia, perhaps of rheumatism, served to remind the self of the vindictiveness of its pursuers, and it sought to exorcise them by repeating, as a wizard goes through his incantations, some old prayers learned years ago for the rhythm of their periods. The memory stuck at a word in the middle of the prayer of St. Chrysostum; and, as consciousness went groping about in the darkness for the missing link, suddenly yet softly it lost its moorings altogether upon the tide of time and then without warning was submerged in the gulf of nothingness. The whirl of a motor-car and the rattle of glass milkjars beneath my window brought the self to the surface again as suddenly as it had descended into the depths of Lethe; and the brilliant sunshine prying at a chink in the shutter apprised the mind that the interval had been sleep. Sleep, sleep! Nature's sweet restorer, balmy sleep! The self here under consideration has another self—a better half, to use a threadbare witticism—who is very indulgent to him in his sleeping, if not in his waking hours, allowing him to sleep according to his own sweet will, quietly or vociferously as the mood seizes him. He does not—so she informs—snore or emit any of those peculiar ingurgitations and puffings characteristic of the usual order of audible sleepers. He does better than that. He sings and whistles; doing the one some nights and the other on other nights; but never, by any chance, doing both the same night; though my other self has often wondered why not, as, to her way of thinking, a judicious arrangement of singing pieces with whistling pieces and an occasional declamation or brief oration would serve to beguile the tedium of her insomnia, and, with a little careful training such as Svengali gave Trilby, might achieve a notable career in vaudeville or high opera. The self cannot of his own knowledge vouch for these his accomplishments, as he has never heard himself exercise them while in a comatose state, nor so much as dreamed that he could exercise them in that condition. It is probably some form of vocomotor somnambulism which seeks an outlet for inhibitions imposed during those waking periods when all of himself is under the control of his consciousness and conscience.

It may be that these psychic eccentricities are due to gastric irregularities, and they could be avoided or controlled by some scientific attention to diet. It may be that four ounces, instead of two, of pork and beans might induce a superior rendition of *Il Trovatore*; or that a double portion of green corn, with a generous topping of mincepie, might yield a performance of the *Goetterdaemmerung* with full orchestration. The only conceivable obstacle to a full house of auditors is the probability that they should have to assemble at the unwonted hour of one, two, and three after midnight and even then should have to wait in their seats for an uncertain period before the psychic muse had gained sufficient control of its resources to begin. In any case, the music would have to come not so much from a cultivated larynx and diaphragm as from a well modulated liver and a thoroughly trained epigastrium. Perhaps the accomplished parodist of Lord Byron divined more than he knew of this discovery when he wrote, 'Maid of Athens, ere we sever, give, O give me back my liver!' Do the juices of deglutition and digestion spread or clip the wings of the psyche according as they accelerate or retard the processes of assimilation and nutrition? How much of matter in the animal is mind, and how much of mind is in the stomach? Until these questions have been given a more thorough-going investigation, it is more or less futile to dogmatize upon the dominance of the one over the other as opposed schools of philosophy are so fond of doing.

How much of the psyche is memory? How much of it is expectation? How much of it is the creation of sense-impressions from within and from without? The self asking these questions is prompted to the act by certain vivid experiences of his within recent years, and they have been of such a character as to weigh heavily upon his heart. He is of a domestic turn: something of a feline domesticity is ingrained in his soul. He prefers a quiet evening by the glow of his own fireside—or in the warmth of his own radiator—to a game of pinocle in a bar-room or even a very long sitting at the 'movies.' Once he was the happy possessor of a home planned by himself and furnished to his taste, and could indulge freely his inclination for propping up his feet by his own mantel on his own hearth-rug. Thus accommodated, the pages of some favorite master of thought and style looked good to him; and their attraction suffered no abatement when courted through a blue haze arising from a roll of tobacco. A shift of circumstances suddenly made it necessary for him to convert his real estate into cash, wrap up his household goods in excelsior and burlap, transmit them by express and himself by the Twentieth

Century Limited with considerable dispatch from the scenes of his domestic revelry. He thought he would never regret the change; nor does he think now that he ever has. Yet, though he has been just as comfortable elsewhere since then, and, withal, healthier in body and mind, scarcely a day or a night has passed that, for a shorter or a longer period of time—perhaps for only a fleeting second, perhaps for an hour or two—some room of the house that once was his, some angle of the premises there, did not envisage itself before him and cast its spell for better or for worse over the serious matters or the trivialities with which he happened to be occupied. 'We are such stuff as dreams are made on,' and so forth. But must the dreams always be some transcript of the past, or some kaleidoscopic disarrangement of it? Shall the self ever learn to dream of the future in terms of to-morrow?

Is not the proper note of all dreaming struck in these wise lines of Longfellow's?—

Not enjoyment, and not sorrow,
Is our destined end or way;
But to act, that each to-morrow
Find us farther than to-day.

Yes; the to-morrow will find us farther than the to-day has found us—farther along toward that port of no-striving and actual non-existence from which there is no turning around. Is the psyche becalmed, like the Ancient Mariner, beneath a copper sky, his companions corpses and himself growing mad for lack of water to moisten his parched lips? What a situation were that for analysis by the psychiatrist, and still better by the introspectionist. Next to Hamlet, there is—if one may venture so sweeping an assertion—no finer bit of introspection in psychological poetry than Coleridge's here cited.

The soul becalmed! No wind from the past or the future to fill the sails of its craft: the past a jumble of sour memories and the future void either of adventure or the hope of ever reaching a haven any more. Is that a mixed figure? Let it stand. It is a faithful representation of the state of mind expressing it. Why should the icily regular, the splendidly null, forever stand at watch over the gateways of the soul? The rules of rhetoric, logic, art—the principles of anything—may in great measure be only the ordered inhibitions of the self, serving better to hide than to reveal it. What soul that is becalmed, at a standstill, dare confess its condition even to itself? Here is a field for the introspectionist, which, if sedulously cultivated, should yield a crop of diagnosis and prescription sufficient to turn aside many a poor sufferer from

self-depreciation and accusation and despair, and save him from the stages of psychic decline ending in a sanatorium, infirmary, or hospital. Could the Fool of every Lear be throttled before jingling his bells in the face of consciousness, many an asylum for the insane might be turned into a school for aviators or a factory for the production of munitions of war.

But what is it to be becalmed? It is to feel one's own pulse and count the beats for symptoms of heart-failure; it is to gather from the state of one's digestion signs of some vague calamity impending; it is to gain from the chill in one's toes omens of an approaching bronchitis; it is to shift restlessly in one's chair under the oestrus of some momentary cutaneous irritation; it is to start some rhythmic twitch of a muscle which, if left unchecked, will develop a tic douloureux; it is to contemplate one's finger-nails for evidence of a needed manicuring; it is to whittle a stick for a reason similar to that which prompted Tennyson to compose his 'In Memoriam' to Arthur Henry Hallam, finding in the 'dull mechanic exercise' relief from depression; it is to jingle the coin in one's pocket with an inward assurance that all is well in respect of the next meal-ticket, at least; it is to rub one's chin with the mute query as to whether a visit to the barber's may be judiciously postponed another day; it is to study the tips of one's shoes with the resolve to save your dimes by polishing your shoes yourself hereafter; it is to recross one's legs with a sense of accelerated circulation; it is to sigh for no mistress's eyebrow but for better aeration of the lungs; it is aimlessly to note the color of the wallpaper, the figures in the carpet, the outline of your shadow on the floor; it may be to bite your finger-nails, to suck the knob of your cane, to twiddle the corner of your mouth, to rotate your thumbs, to drum on the arm of the chair you happen to be sitting in, to count the palings in the fence opposite your window, to touch every tree and post you pass on your way nowther in particular, to whistle a tune, pick your teeth, squint your eyes, wag your ears, or blow your nose when there is no need for that calisthenic. It may be a hundred or more eccentricities of deportment, all of which, singly and in sum, are sure warnings of your psyche's annoyance, but no certain disclosure of any the slightest part of her true self.

And when you get up in the morning, who can say where your true psyche lingers? You awaken to the rattle of milk-jars in the street; to an altercation of two drunken men on the sidewalk; to the chaffering of sparrows in the gutter; to the booming tread of the cook as she steers her portly bulk

from kitchen to corridor and from corridor to pantry. You move your limbs to ease the kink in your spine and straightway bring them back from a cold region of the sheets to the hollow they had been warming for themselves all night. You wonder whether your physician's advice to take a cold plunge every morning is sound after all. You close your eyes against the blinding patch of sunshine that strikes a glass pitcher containing water and breaks, like the clash of cymbals, upon your naked nerves. You note an assertive movement in your alimentary tract and consider whether, by some process of applied eugenics, the human animal could not evolve an improved production of itself in the matter of alimentation so as to obviate the use of an early riser. You bury your face in the covers but, instead of going to sleep again as you want to, you raise disquieting queries as to the lateness of the hour and ruminate upon the day's work before you. That visit of Jones's yesterday and the answer you promised to mail him to-day fix themselves in your attention. The shopping you have to do between office-hours, the winter's supply of coal you have to order, the revolution in Russia—these and sundry other remnants of your diurnal celebration stir and murmur in your consciousness, and behold the stress of living again lays its heavy hand upon you, as it were, seizes you by the scruff of your pajamas, and you are awake. You take the cold plunge, you survey with dismay the toll of hair your brush and comb have taken from the region of your growing bald spot, you are reminded, as you clean your teeth, that the filling in that troublesome molar of yours will require another visit to the dentist, you gulp your coffee with a feeling of gratitude for its grateful effects, you hie yourself away into the street and join the procession of tramping shoes that hurry off toward the middle of another week.

And you go, careless of whether or not your psyche is going with you; content if she—like your liver, your heart, your stomach—does her work without bothering you; and convinced that if she needs overhauling, it would be better to put yourself in the hands of an expert who will diagnose your case on the basis of comparative psychology rather than upon the basis of that intensive branch of the subject which dubs itself introspection.

MUSICAL EDUCATION

By HARLOW GALE

In estimating the aesthetic value of any work of art, or in comparing the arts among themselves, it will help to clarify our subconscious or implied mental processes if we write out our table of aesthetic ideas and emotions in their relative value order. Not that perhaps any of such tables of art values would altogether agree. But they would doubtless have enough in common to greatly aid a mere verbal dispute. If the disputants took the trouble to trace the genesis and evolution of our instinctive and acquired emotions, they could come to more agreement than the mere catalog of the intuitionists. Something like the following list, then, can help to objectify our latent criterion of art discussions:

A TABLE OF PSYCHOLOGICAL AESTHETIC VALUES

Nobility, grandeur, peace. Purity, serenity, genuineness. Ethical struggle, self-control, victory. Grace, sweetness, loveliness. Love ecstasy, longing, dreamy sadness. Friendship, sympathy, hope. Strength, joy, gladness.	} Imagination Ideas and Emotions of Art
Decoration, embellishment. Accomplishment, success. Imitation, custom, propriety. Novelty, curiosity, excitement. Admiration, praise, beating. Display. Jealousy, passion, revenge.	} Instincts of Nature.

In connection with some such table, let us make a modern psychological application, in terms of the value of the feeling element attached to our ideas instead of the compartmental 'faculty,' of Ruskin's 'Definition of Greatness in Art' in his famous 'Modern Painters:—'That art is greatest which conveys to the mind of the spectator, by any means whatsoever, the greatest number of the greatest ideas; and I call an idea great in proportion as it is received by a higher faculty of the mind, and as it more fully occupies, exercises and exalts the faculty by which it is received.' Applying this practical test

to music, let us recall how the former 'Musical Sense,' which has survived with the old intuitional philosophy as the foundation of even such valuable and stimulating books as Edmund Gurney's *Power of Sound*, has vanished, like the 'Moral Sense,' into many and more tangible components. Thus an analysis of the very complex art of music results in such elements as:

Rhythm, tempo, accent, dynamics, tone quality, melody, harmony, contrast, similarity, variety, repetition, biographical and historical associations with the composer and with the listener, mutual influence with dancing, painting, poetry and the drama.

When, now, one comes to compare the teaching of music with the other arts, as literature, e.g., it is distressing to see how the lower aesthetic values preponderate. This condition is due to the teachers of music having learned an instrument rather than the literature of music. As an example, a census of some 500 teachers of music in a city of 300,000 people gave only about twenty per cent. who had become known to a constant attendant at all concerts for many years. And, of these 100 known music teachers, only about twenty had proved that they knew enough good music to give a recital program. This situation, too, where there was the stimulus of a symphony orchestra, a chamber music society, several choral clubs and music schools, and a University department of music. Thus the great mass of teachers, absorbed in the difficulties of their instruments, seldom rose higher in aesthetic emotions than accomplishment.

Such musicians are on the literary plane of elocutionists, displaying themselves and their organs, rather than the higher values of art works. Occasionally, of course, the average music teacher will chance to play a Bach fugue, a Beethoven sonata, a Schubert impromptu, a Chopin waltz, a Schumann *Träumerei*, or a Brahms intermezzo; but this is usually because he was taught a stray art work amid the customary round of studies and display pieces. But even the higher elements in these sporadic good works are not apt to be brought out in comparison with works found and studied on one's own initiative. This elocutionary plane in musicians is further intensified by the commercial motives and values, which should be the least stimulus in art, being more prominent in music than in any of the other arts. Outside of society's triflers with music, the great mass of music students begin to give lessons as soon as possible to pay for their own lessons or for spending money.

Like the older fashioned school and college curriculums, the present musical repertoires are still passed down mostly by custom and imitation. While the comparatively narrow range of concert and recital programs shows the tyranny of imitation and tradition, so interesting psychologically, it is depressing in the preponderance of display, curiosity, novelty and accomplishment. Imitation cannot lead to very high emotions. To be sure, literary courses have their somewhat stereotyped 'Whan that Aprille with his shoures soote,' 'She was a vision of delight,' 'Weary of myself and sick of asking,' 'Little thinks in the field yon red-cloaked clown,' 'All's well with the world,' and 'Das Ewig-Weibliche zieht uns hinan.' Yet literary students get vastly wider and higher knowledge of the context of these classics than musical students do of their occasional classic. What a shallow imposter we would brand a teacher of such poetic beauties who had never read and felt the whole works and gamut of Chaucer, Wordsworth, Arnold, Emerson, Browning, and Goethe; and yet how very few teachers of music have a corresponding intimacy with the immortal works of Bach, Beethoven, Schubert, Schumann, Chopin, Brahms and Wagner? Or, with the specialization in the literary forms of the sonnets, lyrics, the drama, and the novel, how many pianists have sat down in the calm hour and lived themselves into the some fifty classic piano sonatas, into the art waltzes from Schubert to Brahms, into the tone-poems from Chopin's preludes and Schumann's Carnival to Liszt's Swiss and Italian Pilgrimage Annals? How many violinists know all the Mozart and Beethoven violin and piano sonatas, or have rejoiced in the finest musical comradeship through the joyous strength of Haydn's 83 string quartets, the heavenly purity of the ten celebrated Mozarts, and the noble greatness of the 17 mighty Beethovens?

Singers and teachers of singing, of all musicians, get and give the least aesthetic musical values. Coming through the display and decoration of the Italian Opera and the cheap sentimentality of Protestant church music, there is little hope for most singers' musical salvation. The type winning the greatest applause and money, like Patti, Caruso, Melba, Amati and Tetrazzini, live so almost exclusively in the pleasures of jealousy, tone quality and dexterity as to be a shocking travesty on all that is lovely, pure, and noble in music. All these shallow theatrical trivialities were eradicated by Wagner and his trainers for the great music dramas, so that such heroic figures as the Vogels, Gura, Materna, Schelper, Lehmann, Burgstaller and Griswold embody the most inspiring struggles and grandeur. When oratorio singers can be subordinated

to an orchestra and such exalting text and music as Bach's two Passions, the Missa Solemnis, Mozart's and Brahms' Requiems, they can perform a high public function. But it is an art tragedy that most singers know so little of the purest song gems which make up a large part of the thousand songs of Schubert, Schumann and Brahms. In efforts to find a singer who could give a Schubert song every Sunday morning for a year, along with some chamber music in a liberal church service, the formerly mentioned 500 music teachers could not furnish a single professional who knew enough Schubert, and the rare function was finally filled by a university woman teacher of literature. One needs no voice teacher at all, only normal lungs and larynx, an enthusiasm for lyric poetry, some imagination, and a sympathetic pianist, to live in the purest romantic joys of 'Die schoene Muellerin,' 'Die Winterreise,' 'Die Dichterliebe,' and 'Die schöne Magelone.' That highest ideal of a song interpreter, Ludwig Wuellner, can be followed by many a lesser man than the late John Fiske, as he sang Schubert by the hour in virile ecstasy.

Another important reason, besides the narrow musical knowledge of most music teachers, why so little of the higher musical components are cultivated, is that even the best educated teachers so seldom discriminate between making performers and making cultivated lovers of music. The overwhelming mass of young people studying music can never be public soloists and should not even be inoculated with the bacillus of showing off in private. But it apparently never occurs to most music teachers to do anything different for their pupils than was done for themselves; i.e., a long course of technical studies and then the laborious mastery of a few repertory pieces and concertos. Instead of thus missing about 95% of our wealth of classical musical literature, it would be vastly better for the teacher, as well as for his pupil, for them to sit down together at the piano and leisurely wander through the original four-hand waltzes of Schubert and Brahms, the exquisite 'Bilder aus Osten' of Schumann, and learn to know through their piano arrangements all the overtures and symphonies of Beethoven. Nothing, also, so helps the necessary facility with a musical instrument and with reading music as the stimulus of good music and the necessity of keeping up with a better player.

Thus far we have considered music taught by private teachers and schools of music, which together still control the great mass of musical instruction. What music has been introduced into our public school systems is largely of the recreation and busy-work type. While it has the advantage

over privately taught music in not attempting to make soloists or professionals, the public school music is limited primarily by the same very circumscribed cultural musical knowledge of its teachers. Here and there, thus, in the scholars' recreation interludes of singing, they chance upon an eternal folk song or even Brahms' famous cradle song, which will stay with them like Lincoln's Gettysburg speech and Silas Marner. But school singing is mostly the exhilaration of fresh oxygen, social competition, novelty and fleeting pretty sounds.

About the same proportion of musical credits can be given to the instrumental and orchestral playing in grammar and grade schools, only that the novelty of fiddles and horns is greater than vocal chords and lungs. For the social good of enticing boys off the streets and giving more esprit de corps to each school by competition, its orchestra can be a very helpful institution. The best that can be hoped for music itself from their enthusiastic hours of ear-splitting practice, however, is that their awakened curiosity will lead them to the children's, Sunday popular, and regular programs of a symphony orchestra.

By the High School age, singing and orchestral playing can reach much more serious art worth. The 'Messiah,' 'Creation,' and 'St. Paul' have begun to uplift adolescent boys and girls above their home level of clothes, bridge and autos. Schubert's Unfinished Symphony and Mozart overtures have already given a genuine art aim to some High School players, whose private teachers have merely started them on various instruments without any inkling of what music can mean. Yet it is only very lately and in few centers that oratorios and real orchestral music, through exceptionally cultivated teachers, have risen above the entertainment level of the grades.

The college and universities present strange musical anomalies. On the other hand there are two adaptations of the Puritanical idea of education by discipline in the college courses in musical theory and in instrumental practice. Harmony and counterpoint correspond to grammar and philology. They are interesting scientific dissection supplements to a living knowledge of music and literature. With the aid of the historical development of musical theory and of philology, some added interest can be given to the products of their rules. But they should be studied only incidentally, after a large body of classic music and literature is accumulated, for they are not necessary for the highest appreciation of art. The music and theory relation is similar to that of reasoning and logic: we can learn logic only after we have unconsciously learned to reason. The modern psychological realization that

all our higher intellectual and emotional processes grow unconsciously through the associations of experience, rather than by the deductive application of rules, should make teachers most cautious about reversing the mental processes.

College courses in the piano and violin are farther from commercialism and display than in the public schools, and are usually supervised by more cultured teachers. But they are still called courses in the piano and violin instead of courses in Beethoven. And the importance given to technical studies and conventional display pieces, surrounding so few musical classics, shows that the universities inculcate musical discipline rather than distinctly aiming at cultivating the highest aesthetic values. How distressing to see college senior women struggling to get in all the notes of a Schütt, Saint-Saens, or Tschaikowsky concerto, with no idea of their mediocre art value, when they do not know a half dozen of Mendelssohn's lovely Songs Without Words, Schumann's poetic Scenes of Childhood, or Beethoven's kings of sonatas. Then, too, concertos on the whole, except as orchestral works, do not compare with our heritage of sonatas, and they should have little place in the piano and violin literature of amateurs. As the final goal of years of technical practice, a true professional soloist, as an honored guest of a symphony orchestra, can humbly add his instrument to the other orchestral instruments in the co-operative rendition of some score of true art concertos.

In the history of music the colleges may get more grounded than the conservatories in Palestrina, deeper in the forgotten lore of Riemann's ponderous handbook, or even to Wallaschek's Primitive Music, but they do not attempt to cover the classics at first hand as in history and literature. When one knows all his Tennyson and Emerson, Schubert and Beethoven, he needs no literary or musical digest. Besides a personal knowledge of the musical classics, the college historical courses hardly yet lead to such classical biographical and analytical works as Spitta's Bach, Jahn's Mozart, Lenz's, Grove's and Thayer's Beethovens, Glasenapp's Wagner and Kalbeck's Brahms.

Both purposes of the college courses in composition are not of high value. For the technical analysis of musical masterpieces is again of supplementary scientific value, like grammar and philology; it does not add greatly to the aesthetic ensemble. The other purpose of practical exercise in composition for developing composers is a relic of the accomplishment stage, which literature had long relegated to that pretence of literature in rhetoric. While the colleges exercise a most

useful function in producing journalists, editors and critics of soundly grounded taste and a trained facility of expression, really creative poets, essayists, novelists and dramatists are not made by the universities. Even less can composers flourish in an academic atmosphere: witness the tragedy of our greatest American composer, McDowell, in Columbia. What would Browning and Brahms,—kindred spirits,—have created amid the routine of committee work, teaching and lecturing? Even the best of university composers, like Professor C. V. Stanford, of Cambridge, would doubtless have risen far higher had he been free to live alone with nature and a few friends, like the great composers. Thus, without disparaging the conventional compositions of university professors of music as contributing to cultural refinement, they are a wasteful diversion, both for the teacher and his students, from their main study of the great musical triumvirate in the three B's. Fortunately, through the more rapid sifting-out process in music than in literature and painting, the composition exercises of the college are quickly relegated to the silent archives of the music store rooms.

When, now, one comes to reflect how more of the higher art elements can be taught in music, let, first of all, a more distinct line be recognized between making professional performers as soloists, orchestral players and opera singers, on the one hand, and, on the other hand, the teaching of music culturally as one of the arts. For the professional purpose let a few recognized and authorized conservatories of music be licensed, like the Leipzig Conservatory, founded by Mendelssohn. This will eliminate the great mass of private music teachers who have neither worthy professional possibilities nor musical culture. They can well be spared along with 'professors' of dancing, the mandolin, and phrenology. Then, with display and accomplishment, the bane of all music, discouraged or eliminated (if human nature can be so far reformed), the cultural study of musical art should start with a pure and distinct standard, as in literature, at the top of our educational system. Let courses in the piano, violin and singing join the shades of Latin and Greek grammar and the quondam pseudo-scientific microscopy and laboratory technique, and, in their stead, let us study directly the ten great composers from Bach to Brahms. Let historical courses in ethnological and folk music, and in the early church, opera and instrumental music of Italy and France form the prelude and postlude and interstices between the great composers at first hand.

More profitable than cross-cataloged courses in the symphony, opera, or sonata will be chamber music, because more

of the real heart of the great composers has gone into their sonatas for the piano and violin or violincello, into their songs for piano and voice, into trios and quartets for strings alone or with the piano, into quintets and sextets, up to the limit of chamber music in Beethoven's Septet and Schubert's Octet. These most intimate art compositions, written for a few friends and for home use, are the most genuine essence of music. Display and accomplishment are here eliminated together with the soloist; the individual player is subordinated in co-operation for the production of joy, grace, purity and nobility.

The University Musical Societies of Oxford and Cambridge have long played chamber music in little groups among themselves for the townspeople, and exchanged programs between the universities. Instead of ascetically practicing on studies and concertos, why cannot our college men and women be arranged into chamber music groups and learn to know the classics which will be an unspeakable joy, comfort and inspiration a life-long in their homes, just like their beloved books? It will be found that very little preparatory technical instruction or practice is necessary to get right at chamber music. Already an occasional amateur quartet of men has found here, as often in Europe, that they can rapidly pass from a few scales and folk song melodies to Haydn and Mozart piano trios, to their 83 and 27 string quartets, to the dozen Schuberts. Playing together only once a week, in the calm and freshness of Sunday mornings, such a quartet can leisurely learn to know thoroughly in one winter all Schumann's wonderfully romantic three string quartets, his three piano trios, his piano quartet and piano quintet. It may take two winters and summers,—for summer Sundays and evenings are the ideal setting for chamber music,—to thus live into Brahms's three string quartets, three quintets, two sextets, three piano quartets, one quintet and five trios. The end and aim of all music in Beethoven's mighty final pentiad of quartets has thus been known through and through in one year by such an amateur quartet, after it had watched and waited in vain for twenty-five years in Europe and America for public opportunities to learn these highest and last words in all music.

If we never read books any oftener than most music teachers read music, we could hardly get beyond the primer. But there is no special trouble in learning to read music, just as with newspapers, if we simply read. Even if our fingers, bowing arm, or vocal chords cannot keep up to our eyes in getting in all the notes, or in speeding them up to proper tempo, our imaginations can fill out how they all would ideally

sound. To play what you can, keep your place, get in again, and not disturb your colleagues, is the practical amateur technique of chamber music. The stimulus of keeping up with the best player in the group, of synchronizing together in tempo and dynamic expression is vastly more helpful than practicing alone.

When it comes to learning the symphonies, overtures, Wagner, Mozart's operas, and 'Fidelio,' it is hardly possible to get together a college orchestra, unless help for the wind instruments is given by the conservatories. Even then, such tedious practice is necessitated by the poorer and irregular players that far more and better knowledge of orchestral works can be attained through four hand piano arrangements. Thus Professor Stanford has long prepared his Cambridge students for the university orchestral concerts by professionals and amateurs under his own direction. Indeed, *mirabile dictu*, the gaining of real musical culture does not require necessarily the playing of any instrument or singing. By simply listening, and, better still, also following visually the music score, one can gain the same high art elements as in listening to reading aloud in the home circle. To be sure, it requires more repetitions to thus know good music than novels, but hardly more than good poetry.

A most valuable aesthetic component which has hardly yet been included in any university courses, is furnished by the letters and writings of the composers themselves. Prolix and involved as they are, Wagner's prose writings in his ten volumes of *Gesammelte Schriften* are a wonderfully inspiring record of the development and struggle of mighty dramatic ideas and of an indomitable, titanic personality. The text to his music-dramas should be studied, either in the German drama course or in the music department, and compared with their folk-lore forerunners in the Eddas, *Nibelungenlied*, Wolfram's *Parzival* and Gottfried's *Tristan*. Wagner's correspondence with Liszt and other friends and his autobiography should be known at first hand. Beethoven's two volumes of letters picture the turbulence of his intense spirit, its isolation and suspicion through deafness, with also a surprising leaven of culture,—all contributing to the tragedy of his life and its gigantic works. The biographical basis of the incomparable grace and purity of Mozart's music is seen in his lovely letters, just as the most refined spirit of Mendelssohn, as the musical genius of wealth and culture, is shown in his two volumes of letters. Along with the immortal romance of Robert and Elizabeth Browning deserves to stand that of Robert and Clara Schumann. Their journal and let-

ters, which Litzmann has collated in his splendid three volume life of Clara Schumann, show not only the poetic idyl of their twenty years of romantic love and art creation, but are also a fascinating picture of the entire art life of northern Europe during the last seventy years of the 19th century. Robert Schumann's *Jugendbriefe* and his *Neue Folge* radiate a poetic sparkle and manly vigor of the highest literary value; while the rhapsodic pictures of his contemporaries and the generous sympathy with all sincere art strivings, in the two volumes of his *Gesammelte Schriften*, give him an immortal place as the greatest word-poet, as well as tone-poet, among all composers. The interwoven lives of Joachim and Brahms with the Schumanns, and the seven volumes of Brahms' letters with the Herzogenbergs, Joachim and others, show the finer, deeper, and more intimate art elements, which were sadly wanting in the crude theatrical grandeur of the Wagnerites. Such letters as those of the famous Vienna surgeon, Dr. Billroth, who built a palatial music room in his own villa to honor Brahms' chamber music and who learned to play the viola therein, are an ecstatic idealization of the aristocratic art patrons of Haydn's and Beethoven's times.

All such sources, rounding out and co-ordinating the art values of musical classics, thus demand the founding and encouraging, in universities and homes, of musical libraries. Not one professional in hundreds has any idea of a library of music beyond a few stray, torn leaves of 'sheet music.' What an illuminating contrast it was to find in the King's College don's rooms of Oscar Browning (the friend and biographer of George Eliot, with her joy in Beethoven sonatas and her grand piano) a special room for his grand piano and library of music adjoining his room of histories from floor to ceiling. Many a cultured home, however, which treasures and uses its complete library sets of Shakespeare, Goethe, Molière, Ibsen, Thackeray, George Eliot, Ruskin, Tennyson, and Arnold, can similarly know, honor and love music by possessing the main or complete works of Bach, Haydn, Mozart, Beethoven, Schubert, Schumann, Mendelssohn, Chopin, Wagner, and Brahms. Besides this first rank, in which the mighty Beethoven towers alone, much delightful companionship will be found in the lyric piano works, two piano and violin sonatas, string quartet and some songs of Grieg; in some of the symphonic poems, smaller piano works, and songs of Liszt; in the earnest and ascetic Caesar Franck; in the piano trios of Gade; and in a small proportion of the songs of Franz and Wolff. After a thorough saturation in the best music in one's library, then one can safely browse about in concerts or public libraries,

and try whether there is anything worth taking home from the pathological melancholy and mania of Tschaikowsky, the bizarre novelty of Rimsky-Korsakoff, Ipollitow-Iwanow and Korngold, the cheerful commonplace of Reissiger, Reinecke, Jadassohn and Sitt, and the emasculated meanderings of Debussy.

Another very important point in musical education is the distinct realization that the highest function of public concerts, after all, is to educate their hearers to revive the music at home through their own copies, either by playing at it or reading it silently. This education by concerts to not needing concerts, while it will be wholesomely depressing to the pride of concert soloists and conductors, is similar to the highest cultural value of Shakespeare, Goethe and Isben through their copies in the home, rather than through the elocution and stage effects of actors. After hearing and seeing musical and dramatic classics given in artistic productions, one can easily learn to carry over in imagination these auditory and visual elements to the intellectual reading of the classics at home. Then, and not till then, do the classics become our real friends and inspirations to everything loveliest and best in this world.

Having established the aims and methods of cultivating the higher values of music in universities, the practical pedagogical problem is to adapt these same aims and methods to the high schools. The singing of Schubert, Schumann, Mendelssohn and Brahms songs for single voice, women's or men's voices, or both, and the playing of chamber music, should be the main aim. Oratorios and orchestras can but rarely compete with these smaller and more adaptable groups of boys and girls. Whether any musical instruction should be attempted in the grade schools is a debatable question. As children can begin their literary education on Scott and Dickens, without wasting any years on ephemeral and cheap children's literature, so can they begin on the simplest and best music. If we had any worthy heritage of folk songs, that would be very worth while in the schools. Until the age of adolescence and its awakened imagination there is no serious call for musical expression; below that is the naive play of primitive instinct.

After all, like the other arts, music is for adults rather than for children. Moreover, it is for men more than for women. Not only is the masculine psychology more fitted to create original music and interpret music, but also to cultivate its higher elements in the home. In the older musical centers of Europe it is the men who make the music: the women listen and crochet. Instead of magnifying the feminine graces

of music, valuable and indispensable as they are, we should emphasize *music for men*.

SUMMARY

1. The lower educational art values of music, compared with literature are due:
 - a. To the extremely limited musical knowledge of teachers.
 - b. To the teaching of the instrument rather than the classics of music.
 - c. To teachers learning music largely through imitation.
 - d. To the wearisome struggle to maintain school and college orchestras rather than chamber music combinations.
 - e. To the survival of discipline in instrumental practice and theoretical courses.
 - f. To the vain hope of colleges discovering or making composers.
2. The teaching of music can be bettered by more application of the methods of teaching literature:
 - a. Suppress the hoard of private music teachers and discourage music as a business.
 - b. Separate the making of professional musicians from musical culture.
 - c. Relegate the production of professional soloists, chorus singers, and orchestral players to authorized conservatories of music.
 - d. Incorporate the cultural teaching of music into our high schools and colleges.
 - e. Teach the musical classics and their composers instead of the instruments
 - f. Cultivate chamber music more than all other forms together, by small groups of students playing in combinations of duets, trios and quartets, and in hearing each other, their teachers' or professional quartets.
 - g. Give courses in the texts to Wagner's works, in the lyrics to songs, and in the literary writings and letters of the composers.
 - h. Teach by example and precept the collection and use of music libraries.
 - i. Show that the highest function of music is in the home rather than in the concert hall.
 - j. Music for adults and especially for men.

STEALING FRUIT AND DECEIVING THE TEACHER

By AMY E. TANNER, Clark University

The following opinions of children were obtained under the auspices of the Public Education Association of Worcester in order to give a vantage point from which to modify the children's attitude. The principals of two of the public schools, who were on the Committee, kindly opened their schools to the study in the belief that the children are representative of the city children in general.

The following situations were presented to the children:

1. Every day when John went home from school he passed by a house that had a large yard with apple trees in it. John liked apples and so he used to go in and take as many as he wanted. If you owned the apples and saw John taking them, what would you do to him?

2. One day when Mary thought the teacher was not looking, she whispered in school. The teacher heard her and saw her and asked her, 'Mary, did you whisper just now?' Mary said, 'No Miss——, I did not.' If you were the teacher, how would you make Mary sorry that she had told a lie?

3. When examination time came Charlie could not do one of the examples in arithmetic, but he saw it on another boy's paper and copied it onto his own and gave it to the teacher. But the teacher knew that he had copied. If you were the teacher, what would you do to Charlie.

These questions were presented to the children by the writer, being read from the paper so that the wording should be entirely uniform, and given to all the children in one school on the same morning, between 9 and 10:30, so that there was no opportunity for discussion together by the children. All children answered them, the teacher of the room was always present and in some rooms the principal as well. The writer recognizes fully that answers under these conditions do not represent the child's *natural* reaction to the situations presented, but are a mixture of various factors, of which the two most important are the punishments he himself has received for such offenses, either at home or school, with perhaps an element of writing an answer to please the teacher. That is, they are in large measure the reflection of the moral stand-

ards of the adults who deal with the child, on the one side, and on the other, of the degree to which he himself has assimilated those standards.

In classifying the papers, the very few children below 8 and above 14 years were omitted, giving for the final returns, a total of 528 children, 270 boys and 258 girls, fairly equally distributed between 8 and 13 years inclusive, with only a few of 14 years.

The returns from the two schools and also from the boys and girls were kept separate, for purposes of comparison.

The reactions to stealing the apples show in percentages a considerable number of nearly equal classes, as follows:

Reactions	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Tell not to take.....	15%	17 4/5%	15%	30%
Chase away	15 3/5	9	3	2
Tell or ask to go away.....	10	15	3	2
Whip, strike, shake or spank....	12	8	9	1
Arrest.	13	4	12	3
Reproach, scold or threaten.....	4	5	10	19
Tell offender's parents.....	6	15	8	6
Tell to ask permission.....	3	6	18	13
Let him have them.....	4	7	5	4
Let him have a few or one.....	2	0 3/5	2	1
Fine.	4	0	0	0
Miscellaneous.	9	16	10	12

The most noticeable thing about these reactions is that a considerable number of them are not punishments at all, viz., telling John not to take the apples, asking him to go away, telling him to ask permission before taking them. These three together make up 28% of the D school boys, and 38 4/5% of the girls; 36% of the A school boys and 45% of the girls. Arrest and the various forms of moral suasion and of corporal punishment, including a report to the offender's parents, amount to 35% of the D school boys and 37% of the girls; 39% of the A school boys and 31% of the girls. An average of about 6% of all the children would even give the boy all he wants or some, that is, would encourage him to repeat his act.

Does it not seem altogether probable that this variety in the methods of dealing with stealing fruit is simply a reflection of the attitude of the home, and to some extent of the school? In a study made some years ago it was found that out of nearly a hundred professors, teachers and college students, approximately thirty of each, nearly every one remembered stealing fruit, melons, etc., when a boy, and none of them even when grown considered it very serious. Most of us look with a cer-

tain degree of toleration if not amusement on the pillaging of our neighbor's orchard. On the other hand we find person after person in Worcester as well as elsewhere testifying to the fact that after vain attempts to secure some fruit from his own trees or vines, he has cut them down. Not infrequently a certain tree is carefully guarded, but is pillaged just when the owner is ready to gather the fruit. Sometimes a state of war exists during the entire fruit season between an owner and the neighborhood boys, while in other cases the owner rather unsuccessfully attempts propitiation by giving to anyone who asks. In this case he is likely to get several requests a day, older children sending younger to make the request. So well do boys understand that the general public will not intervene that in one known case, school boys going home at noon would jump a hedge about a foot and a half high, shake the trees and gather the pears and apples in the sight of dozens of people, for the most part men going home for their nooning.

The writer has just learned of one instance of bargaining which throws an interesting light upon the property sense of some boys. One resident was about to leave his house shut for a number of weeks, and in an endeavor to save for himself some of his fine pears, he managed to assemble several of the boys of the neighborhood, told them he was going away, and asked them if they did not think it would be fair for them to leave one of his trees untouched and protect it from other boys if they themselves had all the fruit from the other two trees. They thought it would be about fair, and kept the bargain. The suggestive thing of course is their assumption that they had some sort of right to the fruit.

The reactions to Mary's lie are as follows, the children being asked what they would do if they were the teacher, to make Mary sorry she had told the lie.

Reactions	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Reproach.	15½%	18%	13%	28%
Scold.	9	12	7	6
Shame before class.	7½	13	5	10
Make admit the lie.	6	7	4	2
Keep after school.	9	14	15	15
Tell parents	7	6	15	4
Whip, strike or spank.	9	11	6	2
"Punish".	8	1	2	8
Rattan or ruler.	4	3	4	4
Send out of room.	2	3	7	4
Send to principal.	4	3	1	0
Miscellaneous.	13	9	15	15
Obscure.	3½	2	4	3

If we put together the various forms of suasion, reproach, scolding, shaming, forcing confession, and perhaps sending out of the room, we find that it includes, of the D school children, 40% of the boys and 53% of the girls; of the A school children, 36% of the boys and 48% of the girls. The word 'punish' is probably a euphemistic term for a whipping, and if we include this and the use of the rattan with the other physical punishments, we find that at school D 21% of the boys and 15% of the girls would use it, while at school A, 12% of the boys and 14% of the girls would do so.

The miscellaneous forms of punishment would in many instances fall under the general head of suasion.

The tone of the papers that fall into these two classes is interesting. Often the child makes it very vivid: 'Why, Mary, how could you tell me a lie?' 'Don't you know God won't love you if you do that?' 'How can anyone love you if you tell lies?' At the same time, it seems evident that the children do not feel the offense to be so very flagrant, and here too the variety of punishments seems to indicate that neither at home nor school is there any one kind of treatment of lies that is generally followed.

The reactions to the third problem, the boy who cheated in examination, are as follows.

Punishment	SCHOOL D		SCHOOL A	
	Boys	Girls	Boys	Girls
Throw the paper away, mark it zero or below passing.....	31%	36%	53%	54%
Not count that example.....	3	2	1	10
Do other examples.....	7½	11	13	11
Do others after school	3½	6	1	3
Lower his mark.....	3	2	3	1
Keep after school.....	2	2/5	1	4
Scold.	4	4	2	0
Reproach.	5	3	7	5
Whip, strike or spank.....	16	14	5	4
Rattan.	3½	4	0	0
"Punish"	2	4	0	0
Tell parents	1	2½	0	0
Tell principal	2	2	1	2
Give another chance.....	2	3/5	0	0
Miscellaneous.	11	11	12	17
Obscure.	2	0	0	0

Here the most suggestive thing is the large proportion of children in both schools who would throw out the entire paper because the boy got help on one example. It seems evident that teachers have rather a uniform way of reacting to this particular offense, and many of the children's papers bring this vividly before one. 'I would tear up his paper into little

bits and throws it into the waste basket,' is a not uncommon form of expression. When the question was raised as to whether it is not rather severe to give no credit on the entire paper when there is cheating only on one example, the response from one principal was very prompt: 'But this is the kind of punishment given both by high school and college, unless indeed the pupil is expelled, and the child must learn what to expect.'

But when we consider that only a small percent of these children will graduate from high school and a much smaller number from college, we might question whether this form of deception and Mary's lie should not be put together with other things under the general head of deception, and fought all along the line, systematically, in school, with certain definite penalties that will be the same always and that will be inevitable. To some of us, lies like Mary's seem fraught with more possibilities of social harm than cheating in examination. Very few of us have examinations after finishing school, but all of us have constantly temptations like Mary's, to lie when we are unexpectedly caught in wrong doing. Ought not the school to combat the lie as such with more diligence, and not attach such undue significance to a situation which the school itself creates and which rarely occurs outside of school?

It was thought that characteristic differences would appear between the two schools, because one of them has some 30% of children whose parents are foreign born, and perhaps an equal number whose grandparents were, while the other has very few children with foreign born parents. For instance, we note that 15 and 9% of the D school children would chase away the thief as against 3 and 2% of the A school, while 18 and 13% of the A school children would give him the apples if he would ask, as against 3 and 6% of the D school children. That is, the D school children, coming as a rule from poorer homes than the A school children, would defend their fruit more vigorously and would be less likely to give it away than the others would. They would also tend less to suasion in this case, while in the case of Mary's lie, they would use it to about the same degree as the others. In all three problems they resort to corporal punishment more than the A children, most in the cheating, second in the stealing and least in the lying. Even if one did not know beforehand, one would infer that the children of D school come from homes that, on the average, are more primitive in their ideas of punishment than the homes of the A school children.

Few sex differences appear that seem significant, unless it is that few girls would arrest the thief as compared with the

boys. Smaller percentages of girls than boys would inflict corporal punishment on the thief, but on the other hand, nearly equal percents of both sexes would use it on Mary, and on cheating Charlie.

Nor was it possible to trace any significant changes in the character of the punishments with increasing age from 8 to 14 years, though doubtless there are such differences. The number of children of each age was too small to make it worth while to consider this problem here.

THE PSYCHOLOGY OF THE TEACHER: AN INTRODUCTORY STUDY

BY MARTIN LUTHER REYMERT

INTRODUCTION

This study has grown organically out of my Norwegian work in child psychology (50, 51). In going over the international literature which had more or less direct bearing upon my problems I was frequently confronted with the remark: "This result is probably due to the influence of the teacher." In my own work also I very soon found it necessary to seek refuge in this mysterious sesame whenever I attempted an explanation, and special statistical and psychological data failed to solve the problem in hand. The fact (witnessed by all studies from all countries of children's ideals) that by far the greater part of the children gain their ideals from the curriculum, and the relation of this to the results of recent studies on imitation and suggestion,¹ indicated to me that the problem of the rôle of the teacher was one which stood in need of immediate investigation by all available means and methods.

Since educational psychology has concerned itself chiefly with the child in school, it has naturally happened now and then that the problem has been touched indirectly, as for instance in the investigations of Meumann, Friedrich, Lobsien, Goddard, Richter, Brandel, and others in the subjects of children's ideals, their interest in the different school subjects, etc. Meumann (43, p. 291) stresses the rôle of the teacher in this indirect fashion when he says that "studies on children's ideals" also "furnish a valuable means by which we may judge our whole educational system."

We do not know, however, precisely (or even approximately) how much credit we must give to the teacher in all these mass investigations. The scientific study of the child, whether by clinical psychology, by quantitative measurements of the school work, or by the great and promising work of general experimental psychology (1, 2, 5, 9, 22, 42, 43) has, generally speaking, only been able to open up questions as to

¹See Burnham, W. H., *Bibliographies on experimental pedagogy*, Pub. of Clark Univ. Library. 1912, vol. 3, pp. 23, 27.

the actual rôle of the teacher. These questions are constantly growing in number, however, and some essential ones repeat themselves over and over, so that we evidently must try to attack them more directly and thereby get suggestions and results which will enable us to check our findings in child study. The study of the child has had industrious workers for many decades, and, gradually refining its methods, has spread to all countries. With the rapid tempo of modern inductive science it has already created an abundance of literature. Differentiating itself into numerous branches, it long ago passed the stage at which one man can master the whole field. A writer in Monroe's Cyclopedia finds it difficult to determine what in modern times shall be included in the term "educational psychology" so complex is already the situation. Child psychology, properly conducted, was long ago recognized as a branch of applied psychology. Well-equipped laboratories, headed by noted psychologists, are established in many countries.

With this general background, it is indeed an astonishing fact that no one has yet tried to study in any exhaustive and systematic way and in as direct fashion as is possible a factor so closely related to the child's environment as the teacher. This lack besides the often necessarily (and often unnecessarily) crude methods is certainly a main reason why child study has been somewhat in discredit among psychologists in general. Thus we see, for example, that Dr. Judd (34) takes precisely this defect as a reason for distrusting child study. He says: "Did you never wonder why, in this age when we are studying so eagerly all the factors in the educational situation, no one has ever undertaken an exhaustive study of the teacher?" And further: "We take up psychology and sociology, but we do not seem to have waked up to the fact that bad order in our classes is sometimes a problem in *teacher study* instead of child study." In his excellent textbook Claparède (14) says: "Given a group of children to bring up, to instruct, what is the attitude that it is desirable the teacher take on coming face to face with them, what ought to be the character of the teacher? What are the temperaments which are the most suitable for the pedagogic vocation?" He is forced, however, to content himself with assigning the psychology of the master as a branch of psycho-technics; the paucity here of his uniformly excellent bibliography is further evidence of the necessity for further detailed research on this problem. The bibliography of the United States Bureau of Education for 1910-11 (71) contains 1910 titles of which only 0.8% have a direct bearing on the teacher,

and of these nearly all are theoretical treatments. In the Psychological Index for 1915 only four or five titles are directly concerned with the teacher.

All this serves to illustrate the situation. In searching the literature for possible experimental attacks on the problem of the personal equation of the teacher, I find that Dr. G. Stanley Hall was the first to have fixed the problem, and that as early as 1896 he had directed his students' attention to it. In "Adolescence" (27, p. 387) he mentions the questionnaire studies of Small (60), Kratz (37), and Sanford Bell (6). Among these Sanford Bell's seem to be the most exhaustive and to give the best indications. The next study is one undertaken in 1900 by Deahl (16). His material, however, is in a shape which makes it very difficult to get any definite results from it. (One of his results seems to be that pupils are least influenced by teachers at the high school age, which is in direct opposition to Sanford Bell's as well as to my own findings.)

A later study is reported by Book (8). One thousand sixty-seven senior high school students wrote compositions on "High School Education" including the point "some sympathetic (or unsympathetic) teachers I have had." The main outcome was: The favorite teacher understands boys and girls, and is enthusiastic, energetic, and mentally young, is interested in his work and has good scholarship without being a narrow specialist. No sex, and no physical appearance preferences were shown. The study is very suggestive, and gives many practical hints, but deals naturally with generalities. We may also mention a quantitative study by Thorndike (67), bearing on the sex of the teacher as a possible influence on the enrollment of boys in the public schools. The value of a quantitative study of such a fleeting factor among a multitude of others of probably greater influence seems very problematic, and his results turn out to be negative.

In 1910, with the study of Ruediger and Strayer (54) in this country, we find for the first time in the literature of experimental pedagogy a work offering an objective method for rating the influence and efficiency of elementary teachers from the point of view of supervision. These investigators asked a number of principals and superintendents to rank their teachers (from 26 schools in all) in certain specific respects. It suffices here to mention that discipline stands first in the ratings of these school authorities, followed by "teaching method," initiative or originality, etc. Later appeared similar studies by A. C. Boyse (12), Miss Moses (44), Littler (40), and finally another by Boyse (11) in which he

offers an estimation blank, compiled from empirical data, for the purpose of estimating the teacher's efficiency on 45 points. Each point is carefully defined, to avoid the use of terms in different senses by the different raters. This plan offers many promising indications for future "standardised" blanks, from which students of education can draw an abundance of material concerning the comparative traits in good teachers for different grades. However, as Boyse points out, the work of standardisation is a very complex and difficult matter, and it is our opinion that numerous special investigations as to the reactions of the child to different traits in the teacher must be instituted and their results brought into relation before any final standardisation is undertaken.

The only studies in French literature dealing with the problem of the teacher that I have discovered are one by Claparede on what pupils think of their masters, and a small but significant one by Joncheere (33). After he had been acquainted with the new class in his normal school for two months he questioned every pupil in a personal interview to discover the reason why he entered the school. It turned out that not a single one had done so out of a real interest in the vocation. The materialistic advantages of the profession were the chief motives. This is indeed an enlightening and fundamental contribution as a background for future investigations of the personality of the teacher.

In Germany the work of J. Dück (20) marks an interesting and practical approach to the circle of problems contemplated in our investigation. In Scandinavian countries no direct experimental attack is to be found. There are, however, in all countries, many valuable statements as to the influence of the teacher on the basis of long teaching experience or from general psychological observation scattered through books and periodicals. As excellent examples may be mentioned those of Jerusalem (31, 32) and H. Gaudig (25, 26) in Germany, and of Nils Hertzberg (29) in Norway. Perhaps even more valuable counsel on the basis of a similarly general background is to be found in the American works of William James (30), Münsterberg (46), and Hall (27, 28).²

This brief review of the present status of our problem we may summarise as follows: The study of the teacher has with the exception of a very few experimental studies been very much neglected. Such studies are, however, of paramount

²As a good background for coming studies in regard to the teacher in this country I would deem it very fruitful to read Dr. Hall's description of the good and bad aspects of the pedagogical situation (28, vol. I. Introduction).

importance in the study of the school child; in fact, they are a *conditio sine qua non* for a large number of problems in child study. They open up a vast and exceedingly complex field for investigation which will demand the co-operation of students in all branches of pedagogical science. It is for the purpose of getting a rough outlook over this field, and for throwing into relief the essential questions which demand immediate investigation, that the present questionnaire study has been undertaken.

Some Remarks on the Method.—The questionnaire method has lately been severely criticized by many noted psychologists. It must be admitted that much of the criticism—when we consider the way in which some questionnaire studies have been conducted—has been more than justified. G. E. Müller calls it “the method of reminiscence.” A French psychologist terms it “La methode democratique.” Professor Jastrow at the annual meeting of “The American Association for the Advancement of Science,” 1916, said: “Many of us think it belongs to the devil.” However, we can understand that psychologists dealing chiefly with pure science will find the method of no value for them. What, however, is more difficult to understand is that an *educational* psychologist like Thorndike (66) after a thorough discussion of the method, in an entire chapter, seems to reach the final conclusion that it, generally speaking, ought to be entirely abandoned. While we can fully agree with much of his criticism, and appreciate the constructive factors in it, we can not agree with his conclusion. Much better do we in this connection understand Claparede (14) and William Stern. Stern (63, Chapter VIII) also at the outset condemned questionnaires, but he later changed his view to the effect, that for certain problems, properly conducted, the method was, although a rough one, permissible. Thorndike, speaking of questionnaires (66, Chapter IX), offers the following program for the future work: “It is to be hoped, that if an equal amount of genius and effort is spent in the next decade upon similar problems, the work will be done by means of *direct expert observation*, of *representative cases*, with reference to *all the factors involved*,³ and

³The most impressive work in analytical science, which tries to take “all factors involved” into consideration I have met, is G. E. Müller, “Zur Analyse der Gedächtnisstätigkeit und des Vorstellungsverlaufes.” *Zeit. f. Psych. u. Phys. der Sinnesorgane.* Erg. B. V., and with which I have been made familiar through Dr. Baird’s Journal Club at Clark University. However, to gain such a gigantic outlook over a situation is probably not given to one man in thousands. In educational psychology, where we are at the mere start, we shall have to be humble for a long time to come.

with a moderate amount of statistical care." This exceedingly voluminous phrase (which also has crept into Monroe's Cyclo-pedia) does not take us very far. Experts are very few.

"Representative cases" in the educational situation of to-day are hard to find; and do not bring out the particular needs, as do the special investigations. It is too early to deal with generalities in experimental pedagogy. We started out that way. Now is the time to gather masses of special facts—and correlate them slowly, as we go along. Where is the genius to take *all* factors involved into consideration! While generally speaking we may say, that in all inductive science, discussion of method may be of more importance than discussion of results, we think it most sane and safe to take the view of Dr. Hall, that method can not be discussed *on a general basis*, and that a method is permissible, when *properly conducted*, it suits its purpose. In spite of clinical child psychology, in spite of quantitative educational measurements, etc., we are not in pedagogical psychology out of the stage at which we need questionnaire studies. Let us use all methods, and correlate the results.

For my purpose the following questionnaire was prepared and submitted:

THE GOOD AND BAD TEACHER

The undersigned desires to ascertain from the memories of adults what qualities made teachers favorite and what made them disliked. Will you kindly answer the following questions, numbering them in your paper as they are numbered below, and the fuller and more detailed your reply, the better.

Please think over very carefully before selecting your teachers as good or bad, and please at the end add any other traits or suggestions that occur to you, and that may help this study. Can you outline your ideal of a teacher in person, etc.? How much has physique, good looks, manners, complexion, physical strength, to do with it; and do moral and do religious traits play any role? Please especially speak of the teacher's influence upon you outside the school.

- I. Please recall the best teacher that you ever had.
 - a. Was this a man or a woman?
 - b. How old was this teacher? Give age as near as possible.
 - c. How old were you when you had this teacher?
 - d. Was it the personality or the methods (or both) employed by this teacher that caused you to like him or her?
 - e. If through his or her teaching, in which subject or subjects?
- II. State in as few words as possible what you remember as to the following:
 - a. This teacher's general appearance (physical, dress, neatness, etc.).
 - b. The quality of his or her voice.
 - c. Enthusiasm—optimism.
 - d. Serious or jovial or changeable in nature.
 - e. Was he or she self-controlled? In what way did it appear?

- f. Was he or she "bookish" or did this teacher bring you in touch with life? Enthusiastic specialist?
- g. Was this teacher strict in discipline?
- h. What kind of punishments did this teacher use?
- i. Had you the feeling of being specially favored? In what respect?
- j. Did this teacher visit the homes of the pupils? What were this teacher's social activities with the children outside of the school?
- k. What was the highest ideal this teacher held up before you?
- l. Has this teacher's influence been of real value to you in your later life, if so in what way?
- m. Have your methods and general teaching management been influenced by (him or her)? If you are going to teach, do you think that they will?

III. Please recall the worst teacher that you ever had.

- a. Was this teacher a man or woman?
- b. How old was this teacher? Give age as near as possible.
- c. How old were you when you had this teacher?
- d. Was it the personality or the methods employed that caused you to dislike her or him?
- e. If through teaching, in which subject or subjects?

IV. State in as few words as possible what you remember as to the following:

- a. This teacher's general appearance.
- b. The quality of his or her voice.
- c. Enthusiasm or optimism.
- d. Serious or jovial or changeable in nature?
- e. Was this teacher self-controlled? In what way was self-control lacking?
- f. Was this teacher "bookish," or did he bring you in touch with life?
- g. Was he or she strict in discipline?
- h. What kind of punishments did this teacher use?
- i. Had you the feeling of being specially misused, or what was this teacher's sense of justice?
- j. Did this teacher visit the homes of the pupils?
- k. Did this teacher hold up any ideal for you?
- l. Has this teacher's influence had any bearing on your later life? If so, in what way?
- m. Have your methods and general teaching management been influenced by this teacher as a negative ideal? If you are going to teach, what do you think will be the bearing of this teacher?

Kindly send replies to Martin L. Reymert.

(Notice. Your paper will be read only by me. Your sex and age?)
Clark University, Worcester, Mass., December 21, 1916.

Seven hundred and fourteen returns in all were received, 370 on the good, and 344 on the bad teacher. I am greatly indebted to the following institutions for taking a great interest in, and helping this study along, by sending returns; above all, the Massachusetts State Normal School (Worcester, Mass.), from which the majority of returns were obtained;

Ohio University, Boston University, Brown University, Rhode Island; Alma College, Michigan; Bethel College, Kentucky; Leland Stanford Junior University, California; State Teachers College, Colorado; Colorado College, Colorado Springs; Buena Vista College, Iowa; Baldwin-Wallace College, Ohio; Alleghany College, Pennsylvania; University of Arkansas; Texas Christian University.

The variety of places from which answers have been obtained is a valuable factor in eliminating the possible uniformity in training and experience of the young people belonging to one special institution. The questionnaires were given to the pupils to take home for careful consideration. Afterwards the answers were delivered at school. In one case the returns were given as regular composition work in school. I have reasons to believe that the answers have not been read by the collectors, so that the factor of full anonymity, which for instance, Trüper has advocated over and over again for questionnaire studies, has been complied with. The median age for the young men and women, giving the returns, is 20, so that one will have to take the psyche at this age into consideration throughout the study. All answers give full evidence of sincerity and interest from the side of the young, and they all seem to have a vivid recollection of a good and a bad teacher. Some have even portrayed their liked and disliked teacher so minutely and extensively, that often *one* single return, would make a small book.

By letting the questionnaire also have a bearing upon the bad teacher, it was the intention to get returns by which we could be able to check our results as to the *good* teacher, in whom we naturally are primarily interested.

In going over the answers, it appeared that some of the questions might have been given a better form. However, as this study is meant to be chiefly *suggestive* and *programatical*, this fact has not had very much practical significance. As to the often mentioned source of error in such studies, viz., that the questions in themselves suggest certain definite answers, I have the general impression that all of the 20-year-old people have given straightforward answers, omitting answers on points where their actual memory was not clear. All students have answered the particular question, in all cases, where results are given in percent, and no remark to the contrary is made.

THE SEX OF THE TEACHER

Much has been written about the relative proportion of women and men teachers in this country, and warnings have

been given as to the constantly increasing number of female teachers in the common schools. But as Dr. Strayer (64) says: "Up to the present time no conclusive evidence has been produced as to the relative efficiency of men and women teachers." Our study here naturally does not intend to give any definite results, but it is to be hoped that it will help to shed some valuable light upon the question.

Dr. Elliot (21) gives the following proportions for 1910:

Women teachers.....	78.9%
Men teachers.....	21.1%

The statistician of the United States Bureau of Education (World's Almanac, 1917) gives for 1914:

Women teachers.....	80.2%
Men teachers.....	19.8%

or an increase of 1.3% female teachers in 4 years.⁴

Let us take the statistics last mentioned as a basis for comparison with our own results:

	Women teachers	Men teachers
U. S. Bur. of Ed. statistics, 1914.....	80.2%	19.8%
Distribution of the outstanding <i>good</i> teachers, designated by 370 20-year-old people in their recalling.	71.5%	29.0%

In spite of the fact then that the young people have met approximately 1 man teacher for every 4 women teachers, they have nevertheless found 9% more good men teachers, than we should have expected (if men and women teachers were of equal value in the school system).

	Women	Men
Out of 370 good teachers.	71.0%	29.0%
Out of 344 bad teachers.	74.1%	25.9%

We see the tendency: there are in proportion to the number of teachers of both sexes more bad women teachers than men and more good men teachers than women, which gives a due confirmation to our previous conclusion as to the need of more men.

⁴ This increase has also gained the attention of eugenicists as a problem of great significance for the future of the race. (Cf. 74, p. 259f.) Speaking of the American situation, the writer says: "Not less than half a million women, therefore, are potentially affected by the institution of pedagogical celibacy,—an institution which is to be compared with that of sacerdotal celibacy in the amount of permanent harm that it is capable of doing to the race." Certainly we are facing an exceedingly complex problem whose solution cannot be brought about by merely pedagogical investigations.

If we look upon the High School Period separately, we have:

	Women	Men
Out of 182 <i>good</i> teachers.....	65.4%	34.6%
Out of 168 <i>bad</i> teachers.....	67.3%	32.7%

Let us examine these results in the light of Thorndike's findings (67) that: "The central tendency (in high schools) is to have 3 out of 8 teachers *men*." "If the two sexes were of equal value then our sex proportions for teachers in high schools should have been:

Women	Men
5	3

whereas we get

For good teachers....	5.2	2.8
For bad teachers.....	5.4	2.6

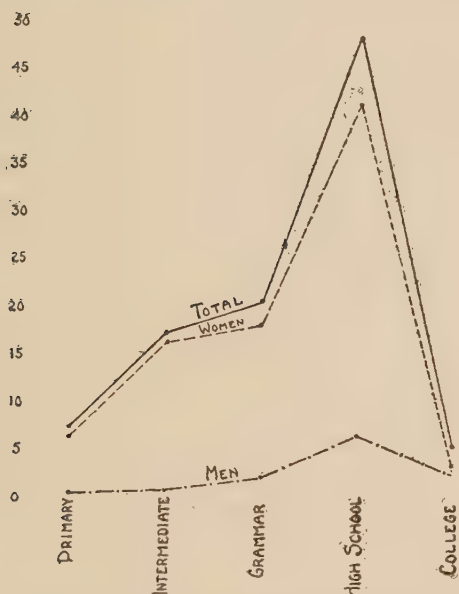
which result although corresponding pretty closely to that of Thorndike, shows in less marked degree the same tendency that we found for teachers within the whole school system. The question as to which sex of teachers suits the situation best at different stages⁵ in the school system for boys and girls will, it is to be hoped, be brought nearer a conclusive solution when we get the standardized estimation blanks mentioned before in cities and rural communities. However, from the point of view of the teacher's general influence upon the pupils, it will always be necessary to check the results from official estimation blanks by supplementary investigations like the different ones which will be suggested in the study here presented. These ought to be carried on on as large a scale as possible in every large city, and brought into correlative comparison with the views of psycho-pedagogical experts.

The general influence of the teacher in its relation to the age of the pupil.—If we take the life period from which the pupils have their most vivid recollections of their best and their worst teacher as an indicator of children's general susceptibility for good and evil influence from *teachers*, the following diagram may give indications. All, both good and bad teachers, are taken into account.

We see, then, the general influence of the teacher constantly rising upward through the school system, reaching a quite remarkable climax for the *high school period*. From the point

⁵ A factor which may have some value for purposes of correlation here is seen in the fact that in one of my Norwegian studies (51) girls from 18-25 years of age had a man as their personal ideal in 56% of the cases, while only one man had chosen his ideal from the other sex.

A
THE INFLUENCE OF THE TEACHER THROUGHOUT
THE SCHOOL SYSTEM. (TOTAL RETURNS 714)

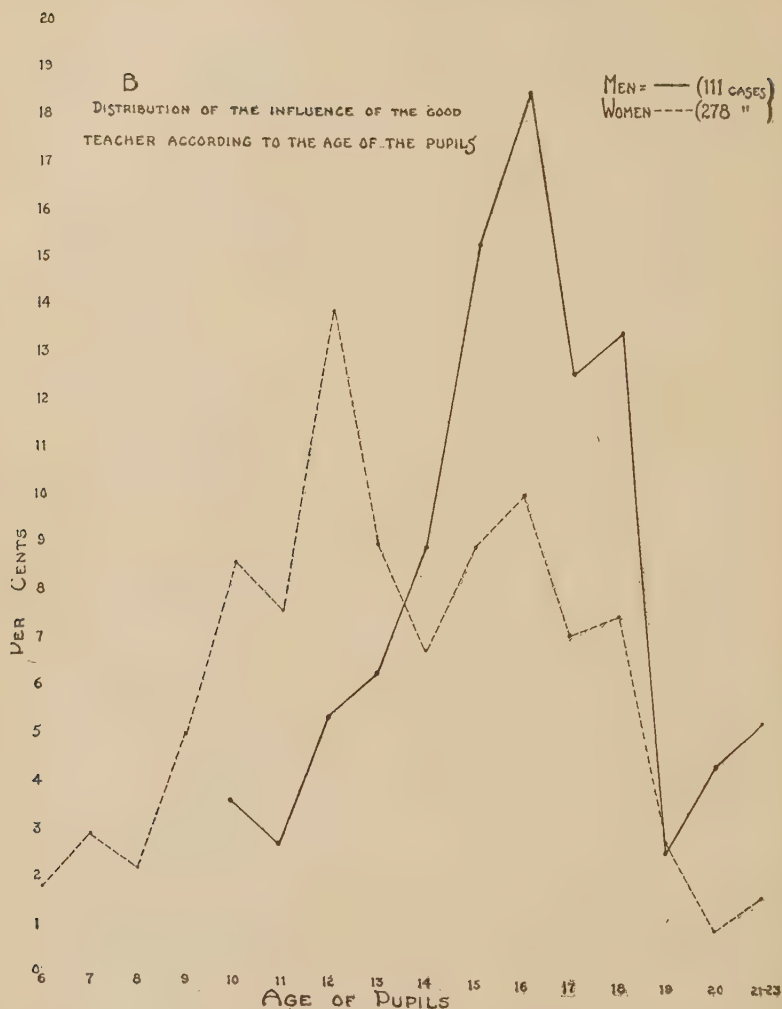


of view of general psychology one may make the objection here, that on the average the 20-year-old people, giving their returns, have a better memory for more recent events (the high school period) than for further removed ones (the grade school). However the vivid colors in which the good and the bad teachers in the grade schools are described in nearly all returns dealing with that period, seem to indicate that the factor mentioned has had very little significance. The few returns for the college age forbid any even suggestive results to be drawn for that period.

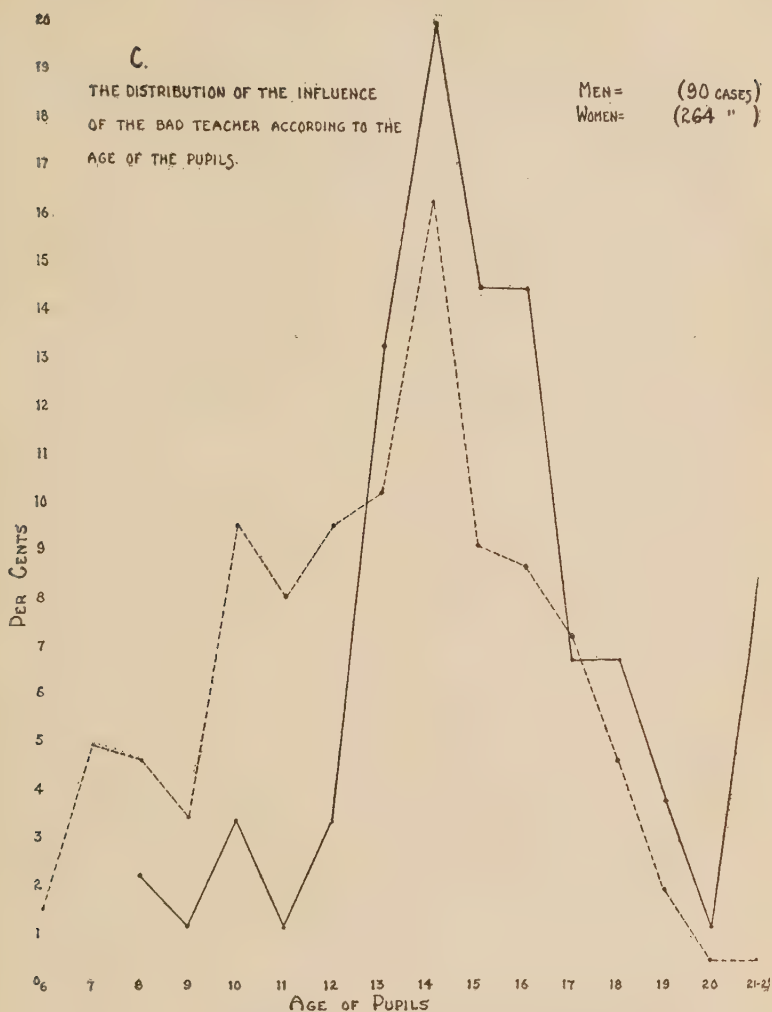
Let us now look in detail upon the relative influence of the *good* teacher according to the age of the pupil. The curves in Diagram B will give us some indications:

The first thing we notice is the considerable peak of the woman teacher curve at 12⁶ years of age of the pupil. This is in all probability due to the onset of puberty in girls, and

⁶ Sanford Bell has the greatest good influence coming in girls of the ages from 11-17, in boys from 12-19.



to their never forgetting having had a sympathetic woman teacher personality at that highly susceptible age. The considerable drop in the same curve at 14 years of age of the pupil may be ventured to a large degree to be explained in the *change of school*. This is generally the first year of high school. The pupil is met with almost entirely new methods of learning, new teachers, etc.; in short, it is a year of readjustment.



Looking at the man teacher curve, we see the remarkable influence of a good *man teacher* for the ages 15-18. From the girls' answers I have no doubt that the factor of the emotional elements following the sexual development of the girl, enters in here, as a very determining one. I take the explanation to be a confusion between the "father image" and the growing embryo of the forthcoming natural unconscious inclination towards the other sex; a period then when a

really trustworthy good man teacher for girls meets an unconscious but all important demand for their future development, better than any other teacher, and a period, when a tactless man teacher can do more harm than any other teacher. (Chart C.) The following diagram C seems closely to check up our suggestive results concerning the *good* teacher.

The curves have the same general shape, the climax of the influence of the bad teacher (man or woman), however, being shifted to 14 years of age of the pupil (from 16 for the *good*). Taking both chart B and C into consideration we reach this general conclusion for the 14th year of the pupils: they report *very few good teachers, and the greatest number of poor ones, both men and women*. What can be the explanation for this remarkable fact? On the one hand, the 14th year may be marked by special determining psychophysical traits. I have, however, not been able to find satisfactory evidence to this effect in the psychophysical investigations dealing with the ages around puberty. On the other hand, there seems to be an abundance of indications for our seeking the explanation *within the scope of the school system*. As we pointed out before, the 14th year generally means the first year of High School. Our result here then may be taken as one more proof that there seems to be something seriously wrong with this "transfer year," within the present school system, and that the Junior High School may here come in as a beneficial and highly necessary remedy. With regard to the preparation and selection of teachers for this new school, I should like to stress from the results obtained in this study, *that one can hardly be careful enough*. If the coming Junior High School is going to be a new school *form* simply, then it will mean very little or nothing. If, however, it is going to be built up on the broad background of all that we know about the psychic, physical, moral, development of the pupil, as pointed out in an excellent outlook over the whole situation by Douglass (18), and if the teachers for this new school be specially and broadly trained, then it may mean nothing less than a *real epoch* in the history of American pedagogy—furnishing thus also an ideal model for other countries.⁷

⁷ If the common complaint that boys in American schools are being feminized on account of too many woman teachers is true, the military training which the country is now planning might to a large degree compensate for this. The nation is in this matter facing a tremendous problem from an educational point of view. What shall be the fundamental principles for "this school in the army" for youth of different training and from different social milieu, and how are they to be worked out in practice? It might be of interest to see how an utterly

THE AGE OF THE TEACHER

While psychophysical measurements and mental tests are in progress in nearly all countries determining gradually the child's "physiological age" and "mental age" in their relation to chronological age, very little or nothing has been done in this respect with adult individuals.⁸ This is indeed a very serious lack from the point of view of the right selection and estimation of *teachers*.

With respect to the greatest benefit to the school child, as well as the social-economic aspect of the question, the teacher's age is of paramount importance. Here again future investigations based on a large number of standardized estimations of teachers, will be the only safe approach to our problem. With such comparative studies in all countries, we should before long have the necessary facts in hand. Until this can be done, the results from our material may serve as rough pioneer indications. Giving as they do the pupils' reaction to teachers of different ages (witnessed by their recall of it at a somewhat mature age), studies like ours here should also in the future be made along with those mentioned above.

The following table A shows the age of the teachers from which the greatest good influence came to the pupils. Each ordinate represents the percentage of all good teachers occurring at the ages indicated on the abscissa.

The general impression we get is that teachers (whether men or women) *below* 20 and *above* 40, are of less influence than teachers between these ages. *The most efficient man teacher* seems generally to be found from 25 to 35 years of age. The best woman teacher seems to have a wider range from 20 to 40 years; with the climax between 30 and 35.

It would be interesting here to compare, if possible, our results as to the age of the good teacher with the results in this respect from the studies of Ruediger and Strayer, for the grade school, and Boyce's for the high school, in which, as we have mentioned, the superintendents and principals

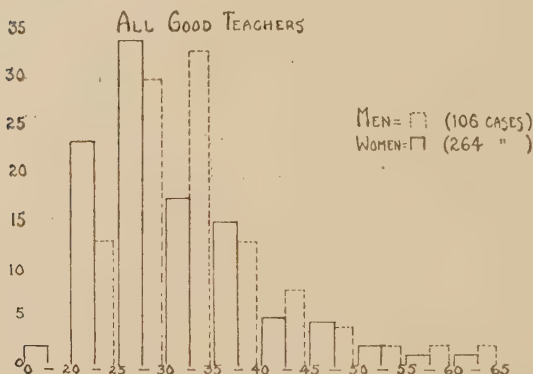
democratic country like Norway has tried to solve this question in practice in its own way, within its army made up by annual conscription of all men 21 years of age. I hope to give a little survey of the military educational arrangements of France, Germany, Switzerland, with special reference to Norway in this respect, in a separate article; meanwhile I may refer to my outline of the Norwegian system (pp. 651-655).

⁸The studies dealing with "old age" may be mentioned. An excellent outlook over the work done, as well as valuable original results, are given in Sanger, W. T. (56): A study of senescence. Unpub. Doctor's Thesis. 1915. Clark University Library.

judged and rated their teachers. Boyce (11) sums up the results from both studies as follows:

"In the matter of experience there are some differences, but the results tend to the same conclusion, that experience is an important factor in teaching ability."

A
AGE DISTRIBUTION OF TEACHERS.



The average experience of elementary teachers for the first and second classes was 13 years, for the corresponding groups in the high school, 11.8 years. If we set the age at which the coming teacher leaves Normal School or College arbitrarily at 22, then we get the best teacher age for the grade school around 35, for the high school around 34,—a result which, as will be seen from our material, corresponds, generally speaking, pretty closely to the outcome of this study, although the woman teacher seems to us to be very good already at 30, which, however, may be somewhat compensated for by the fact that she generally starts teaching about 2 years earlier than the man.

THE PERSONALITY AND THE METHODS OF THE TEACHER

Our question here had the following form: "Was it the personality or the methods (or both) employed by this teacher that caused you to like him or her?" As no noticeable differences between the grade school and the high school could be found from working up the material, the following table gives an orientating summary view of the answers, in percents:

Women's Returns			Men's Returns		
Good Teacher			Good Teacher		
Personality	Methods	Both	Personality	Methods	Both
19	3	78	22	12	67
Bad Teacher			Bad Teacher		
33.3	12	54.7	26	5	69

Let us try to examine the women's returns. The first we notice is that personality and methods in the good teacher seem to be intimately connected. The confusion of teacher with subject matter (and vice versa) which children and youth are very prone to, may here be an explanatory factor. On the other hand, this very factor points to the equal importance of both the teacher's personality and the methods employed,—from the point of view of evaluation and selection of teachers.

Educational quantitative psychology has touched this problem—as to learning—but very little light is yet shed upon it. From his gigantic statistical study of elementary mathematics Dr. Rice (66) draws the following conclusion: "The facts here presented in my opinion will allow of only one conclusion, viz., that the results are not determined by the methods employed, but by the ability of those who use them. In other words the first place must be given to the personal equation of the teacher."⁹ Thorndike says that Dr. Rice's material does not allow such a conclusion and points out other devices by which we may get at facts in this question. I have mentioned Rice's study because he is the first to try, by measuring of the school work, also to take the important question of the influence of the teacher into consideration. By more direct methods (as advocated by Thorndike) we may hope that educational quantitative psychology in the future also will try to study the teacher.

⁹ In his book of 1913 (52), Dr. Rice has abandoned the above view, and regards the personality of the Superintendents (as that of their staffs) as the chief controlling factor for spirit and results in the common schools.

Turning again to our table, the remarkable fact stands out that for one-third of all the poor teachers the disliked personality seems to have been the sole determining factor while the personality of the good teacher is stressed by only about one-fifth of all cases.

This proportion (3:5) gives food for thought. That the bad teacher is described as using poor methods for a time as often as the good one, is also significant in this connection. It should be mentioned here that "the personality of the teacher" is a tremendously broad term, and that in fact, in the popular sense in which it is used here, it embraces a person's whole "make up." In the myriads of elements which make a personality, the emotional factors may well be said to be of all importance, especially when we see a personality, as we do here, reflected in the minds of (or in the memory of) children and youth, who themselves have actually experienced the effect it may have. In many of Dr. Hall's studies, and those of his pupils, as also in several English and German ones, valuable light has been shed upon the emotions in children. A remarkable recent study by Watson and Morgan (69) based upon experimental data takes us still further, and is of special interest in our dealing with the teacher's personality. Leaving out the experimental background I quote the following:

"So convinced are we of the possibilities of getting higher incentives or drives from the use of these emotional factors, that we are sure our selection of teachers would be greatly influenced by our views. We think it would be a safe move now to provide in the early grades men teachers for girls and women teachers for boys, these teachers to be chosen for their pleasing personalities and for their abilities to attach the pupils to themselves in strong but wise friendships."

Further, he says that few of our present teachers "have the gift of controlling and using the pupil's emotional life." I have given so much attention to this study because it is my belief that through studies like that, as well as through Krasnogorski's (36) and Dr. Mateer's (41), a clear way, and perhaps the only one, is pointed out, for getting facts in the extremely complex, but also extremely important emotional relationship between child and grown-up, or, in our connection here between pupil and teacher. If the studies on the conditioned reflex can safely be brought over into the human field (as Dr. Mateer's results especially seem to indicate), then we shall have numerous possibilities before us for work in the emotional field which has hitherto remained so obscure.

The ideal teacher personality has been portrayed over and over again in different phrases of nearly every *palladium*

within the history of pedagogy. (3) All of them gave it "ready made." The only trouble has been that their literary ideal teachers (Lassal's is an elaborate example) never have existed in reality, but have been and are a never-ending memory trouble to all students in education. Now should be the time when we, carefully and slowly through investigations, with the use of all available means and methods, should begin trying, on an empirical basis, to build up this ideal, not as a universal *unicum*, but on differential lines.

What sort of personality is most suitable as a teacher for girls of certain ages? What for boys at the different stages in their development? What sex of teacher for boys, for girls, of certain ages? What age correlation between teacher and pupils? etc.

These and many other highly important questions relating to the teacher, are now of great significance. Someone has said that the history of philosophy is "the history of human errors." The same may be true of the history of pedagogy, but we pedagogues are at least now in the fortunate circumstance of gradually getting means by which to correct the errors.

The main school subject (or subjects) through which the good and bad teacher's influence was particularly felt by the pupils. Two hundred and one pupils answered the above question for the good teacher, 120 for the bad teacher. The remaining part of the pupils say "all" subjects, which statement, indefinite as it is, well goes to show that strong personal attachment to a good teacher gives an interest on the part of the pupil, so to speak, in whatever subject she or he teaches. Still more markedly (according to our figures) is the reverse true in the case of the disliked teacher. The personal dislike then seems to be for a great many pupils a determining factor in diminishing their interest in whatever subject he or she presents to them. The following typical examples may be cited:

"She made me tremendously interested in History—a subject which always had been a bore to me. Through her winning ways and personal talks I got so fond of her, that I began to look forward with joy to her lessons. Before I got her, I used to dread every hour in History." (College girl in recalling a high school teacher.)

"His personality and ways were such that you could not avoid listening with interest to whatever he taught." (College boy recalling a high school English teacher.)

"I think we all felt so repulsive against her, on account of her general manners and all, that we paid very little attention to all that she said." (Bad high school teacher.)

In the now so numerous and elaborate mathematically

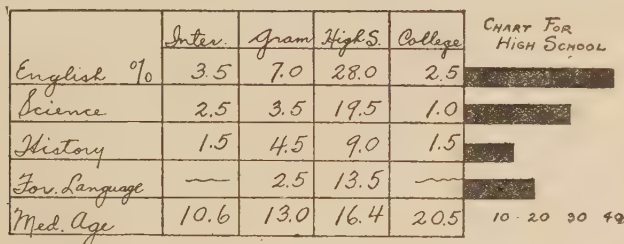
worked out international studies of children's interests in the different school subjects, the important teacher-factor here brought to light has hitherto been totally left out of question. This is indeed a very grave objection against them. Such studies in the future may possibly be made in this general way: Expert evaluation based on long and thorough observation of the different teacher personalities in the particular school, then the results of this, brought into correlation, with the children's returns. I have no doubt that we in this way would find a high correlation coefficient. The emotional life of the child and youth (we may take it out of almost every chapter in Dr. Hall's "Adolescence") is the very basis of their mental "make-up." Pure logical or intellectual judgments are indeed very rare. Hence then we have the confusion of teacher with subject matter, and vice-versa, not only generally speaking, but also in cases, for instance, where the pupil has outspoken personal ability or inability in a certain subject, or subjects. In reading, for instance, a statement like this (there are many like it):

"I simply could not stand her (her shrieky voice still rings in my ears!) and I firmly believe that was the main reason why I lost all my interest in mathematics for about two years." (College girl on Freshman teacher in high school.)

we get a clear impression of the all-importance of our beginning to realize the significance of the dynamic-emotional abilities in the teacher's personality, and especially "the sympathetic touch," without which many a child may be given a transferring help even in a purely intellectual school subject, like mathematics. Some people are children their whole lives, in this respect, as bibliographies, especially of artists, furnish abundant proofs. Sympathy and consideration, however, are not the only emotional reactions towards which the teacher should strive. We would also emphasize the importance of righteous anger and indignation, within normal limits to be sure, through which the pupil may learn how to meet these emotions in others, and to transfer them into valuable incentives for personal effort.

Here, it seems to the writer, we are up against a great problem in modern pedagogy. The Herbartian doctrine of interest is often misunderstood. "Froebelianism," and "Montessorianism," "Lighthardianism," and all other valuable points of view, especially for primary education, are taking too great a place in secondary education. Life is not play; it is very rarely that life means an opportunity for the individual to follow his interests, etc.

Turning again to our material, the following distribution table of the main subjects through which the pupils have met their best teachers gives us some interesting indications.



The striking fact in regard to science was that it over-balanced English throughout the school system, especially so in the grade school, and a little less markedly in the high school—as to number of disliked teachers. From the returns the following reasons may be given as typical:

1. "He knew his subject very well (physics) but he did not seem to understand that he talked over our heads the whole year. Some told him so, but he went on as before." (High school.)
2. "She seemed to think that there was nothing else in the world than mathematics. If you were not very clever in that, she would not have anything to do with you."
3. "She taught Home Economics out of a book"¹⁰

An overwhelming majority of bad science teachers are characterized as specialists, lacking a broader outlook, using bad methods, taking interest only in the clever pupils, not interested in the subject, etc. The English teacher comes in second as to number of bad teachers. With a summary view over both our tables we may stress this:

The English teacher (as also English as a subject) has the greatest good influence and may have a considerable bad one, especially in high schools.

The science teacher (and the sciences as subjects) may have a relatively great influence; in this study, however, the

¹⁰ We may quote here an amusing and instructive experience of Dr. Seashore (58, pp. 79): "As a child I had the advantage of learning arithmetic under a teacher who did not know the subject. She had difficulty with fractions, but had the good grace to leave us to our own devices. We discovered that after reading the introductory statement for each new section and performing the required operations with confidence in our efforts, we had but little need of the teacher The impetus thus gained was a permanent asset. Although I later had good teachers, I proceeded by the same method with algebra, geometry, trigonometry, and conic sections" Although this observation contains valuable suggestions, it would be rash to generalize on it!

bad influence from them seems almost twice as great as the good.

Foreign language has the smallest number of bad teachers, and on the positive side seems to rank high in the high school.

The final suggestive results may be that they all deserve special attention—as to fundamental training, as well as through practical supervisory measures in schools. As it is at the present time, a large number of high school teachers seem to be getting their material and indirectly their methods from the colleges, a state of affairs anything but sympathetic toward the high school mind. On the other hand a majority of the teachers from the normal schools may have a large amount of the theory of teaching, with little subject matter. Taking all different factors from the entire study here presented into consideration, the general impression remains that some fundamental changes in the high school teachers' preparations seem to be an urgent need of the time. The problem is at present under discussion and consideration also in most of the European countries.¹¹ As to the rôle of Educational Psychology in this matter, it is high time to turn more to a differential psychology of the adolescent years on the one hand, and try all possible means of getting at the influence of the teacher for these plastic years, on the other. The day must come when no teacher is allowed to enter into teaching in a secondary school without having had a thorough course in Educational Psychology—arranged with special reference to the subjects he is going to teach (35), as well as the sex and age of his coming pupils. By international comparative studies and views we may hope for a reformation of the present situation in the near future.

THE PHYSICAL APPEARANCE OF THE TEACHER

According to common opinion among school authorities, the physical appearance of the teacher, and his personal "magnetism," are very great factors in the teacher's personality, and have great effects upon the children. We have up to the present time very few objective data upon this question. What our returns may show on this subject may serve to point out the necessity of investigations here, and give some indicative results. It may be that the coming standardized teachers estimation blanks will give material enough for correlations

¹¹ In Germany: "Bund für Schulreform." (Berlin, Founded 1911.)

In England: "The civic and moral education league." London.

In France: "La league d'éducation morale." Paris.

All three have publications.

on a large scale. However, it will always be a problem besides to get the children's reactions, and this we think can no better be done, than (as in our study here), by obtaining returns from somewhat mature people, who are (as is the case here) not too far removed from the experience in time, and who on the other hand are able, on account of their training, to look calmly back over former vivid experiences in this matter.

Let us first see what our returns say about:

THE GENERAL APPEARANCE OF THE TEACHER

	Good		Bad	
	Men	Women	Men	Women
Good looking.....	60%	74%	..	12%
Attractive.....	25	17	14%	21
Not good looking.....	15	9	50	51
Ugly.....	..	..	36	16

It should be taken into consideration here that by far the greatest number of the returns are from young women. What we get then, is that 85% of all good men teachers and 91% good women teachers are designated as good looking or at least as having had a pleasing appearance (attractive); while the bad man teacher was not good looking or ugly in 86% of the cases, the bad women teachers in 67%. Even if we take these numbers on their face value, our result seems to indicate clearly that there is a high correlation between personal pulchritude and a good teacher, in the common schools—a fact which naturally does not exclude the good exceptions, as we for instance have them in our study here. The 36% bad men teachers designated as ugly corresponds largely with the ages in the recalling young women of 14-15-16. Their appearances are pictured in such minute details as to back up fully what we have mentioned before as to the high degree of sensitivity for outer personal attributes of a man teacher for those girls' ages. We are told here of the color of his hair, the way he wore it, the color of his eyes, the nature of his looks, his features, the way he used to smile or grin, his complexion, whether he shaved often enough or not, to what extent he manicured, to what degree his shoes were polished, etc.! Here are some terms used in regard to the bad teacher: "Sour looking," "stern looking," "awkward looking," "large

bulging eyes," "effeminate face," "stiff face," "shiny face," "sharp features," "hard face," "hair down in his eyes," "dried up face," "stubby hair, and long moustaches, always wet," "black nails," "awful smelling breath," "never smiling face," "ever smiling face," etc. One young girl tells a whole story about her former teacher in the following words: "He looked like 'Ichabod Crane.'"

Some general outstanding characteristics of the good woman teacher may be noted: "Motherly looking," "sweet face," "cheerful face," "rosy face," "intelligent looking," "delicate skin," "striking carriage," "stately," "quick in movements," "graceful walk," "old type of beauty," "she was one at whom you would like to look a second time," "she appeared like a queen, yet was not lofty," etc.

The following table gives us some indications as to some physical attributes of the teacher:

	Good		Bad	
	Men	Women	Men	Women
Figure:				
Stout.....	7%	18%	25%	33%
Medium.....	32	48	17	14
Slender (slim).....	61	34	58	53
Height:				
Tall.....	55	86	61	46
Medium.....	13	14	9	26
Short.....	32	14	30	28
Complexion:				
Light.....	6	43	..	28
Dark (including brown hair)....	94	57	..	42
Health:				
Poor (nervousness).....	11	16	7	25
Good.....	89	68	93	75

Leaving these numbers for the present we will first stress the apparent difference in health between male and female teachers. The percentages, 11% of male and 16% of female teachers, characterized as not healthy, have been compiled by carefully going over the returns and marking the bad teachers and those good teachers who clearly are designated as having been nervous, so that the pupils in their recalling remember that they actually suffered, although they in the eyes of the pupil seemed generally to control it wonderfully. The greatest part of all nervous teachers (78% of them) are more than 35

years of age. We can of course place very little significance upon so little material as we have here; it is an interesting fact, however, that this last finding seems to correspond pretty closely with the results of the latest German study. (53) Ninety-five teachers under treatment for nervous diseases in the psychiatric clinic in Jena had entered in the following years of their age:

From 20 to 25 years old.....	7.4%
From 25 to 35 years old.....	20.0%
From 35 to 45 years old.....	44.2%
After 45 years old.....	28.4%

As we see, most of the patients had broken down between 35 and 45 years of age, and Rohde finds that the nervousness is of different sort before and after the 35th year of the teacher. Before, it has very little to do with the vocation, is not "Berufsnervösität;" after the 35th year, it is decidedly so. This result seems in direct opposition to earlier investigations, for instance, Wichmann's; and the conclusion Terman draws from studies up to 1912, in his excellent book. (65)¹² "The investigations prove that it is the beginning teacher who runs the greatest risk of pathological nervous exhaustion," may not be finally established. Dr. Rohde's table is of interest also in connection with the good teacher's age, as we have brought out in this study, the middle age of them all not exceeding 35 years.

As to the influence of the teacher's health upon the pupils Dr. Burnham says (13): "With the emphasis now placed upon school hygiene teachers suffering from tuberculosis, nervous disorders, and the like, will not long be permitted in the schoolroom." "Teachers who can set an example of healthful living and normal mental activity will more and more be demanded for the public schools." It seems from this study that there is a definite positive correlation between excellence of the teacher in the common school and his or her health. "She was so nervous, that she could shriek over the smallest thing now and then, and frighten us almost to death," writes, for instance, a college girl in recalling her 8th grade teacher (aged 41-2).

Turning now to the dress of the teacher, we may first note that all good teachers are recalled as having been "very neat" or "neat" in dress. In my Norwegian study (50) I was able to draw the conclusion that children between 7 and 11

¹² An excellent little monograph, which should be in every teacher's library, not in the ordinary sense of that term, but it should be looked over frequently as a memorandum for the teacher on how daily to invest his best capital—the physical and mental health.

years especially lay great stress upon the appearance of their acquaintances. From this study it turns out that a similar conclusion seems to hold still more true for the ages of 12 and 18 in girls, and that dress generally speaking plays a great rôle in children's estimation of their teachers.

The teacher's general manners seem also to be an important point in the make-up of his personality:

"For example he would slouch way down in his chair and practically sit on the back of his neck. The following is horrible to tell, but it illustrates clearly what I mean. He used to clear his nose in his throat and then use the open window in place of a handkerchief or spittoon. We were usually working at the board during these occurrences and he probably thought we didn't notice him, but I believe that some few always knew, and the rest soon heard about it." (College girl in recalling a high school teacher.)

Similar statements are not rare. To sum up the indicative results as to the good teacher's general physical appearance it appears from this study that the ideal American woman teacher should be: Good looking (or at least attractive) with a general cheerful expression, dark or light complexioned, rather tall, blue or brown eyed, of a median figure, healthy, neat, well dressed, stylishly or in subdued colors, have refined manners, a good carriage, be "quick in movements," have "a graceful walk," etc.

The ideal American man teacher is indicated as: Dark complexioned, tall, slender, physically strong, healthy, well dressed and with good manners.

The bad woman teacher is recalled as follows: In 86% of all cases not good looking (or ugly), slender, tall; in one-sixth of all cases, in bad health (nervous), in one-fifth of all cases designated as untidy in dress and person and very often with careless manners.

The bad man teacher: Slender, of medium height, dark complexioned (94%), in 7 out of 8 cases unattractive or actually ugly, while every other one of them are designated as untidy in dress, and many noted for bad manners.

It should be noted that these traits mentioned (on account of the fact that most of our returns represent the recollection of young women), should belong especially to the ideal American teacher of girls. Future investigations ought to bring out the physical ideal teacher for boys, of different ages, and also try to designate whether there are outstanding differences in preferences at different stages of age, within the school system, for boys and girls.

What seems, generally speaking, to have been brought to light in this study is that physical appearance, dress, manners.

etc., are essential factors in the teacher's personality, which on account of the great suggestibility and the lack of broader judgments in children, may, at least temporarily, increase or decrease the influence of the teacher.

THE TEACHER AND DISCIPLINE

There is no noticeable difference between the grades and the high school here. The answers allowed the three definite groups—strict, moderate, lenient. The following table gives opportunity for numerous comparisons, not only for the differences between the sexes, but also for those within them. To see whether the specially young teachers would show any definite difference from the older, they are divided in the table into two groups. "Young" means below 30 (or 30) years of age; "Old," over 30.

NATURE OF DISCIPLINE—DEGREE OF STRICTNESS

	Good Teacher				Bad Teacher			
	Men		Women		Men		Women	
	Below 30	Over 30	Below 30	Over 30	Below 30	Over 30	Below 30	Over 30
Strict.....	47.8	52.2	61.7	49.88	18.9	36.8	51.0	71.2
Moderate....	52.2	43.4	21.4	36.25		5.3	3.4	3.4
Lenient.....		4.4	16.6	13.06	81.1	57.9	45.6	25.4

We shall point out a few of the facts and leave the rest for the reader's consideration.

The good teacher. In the larger percent of cases the "old" man, according to our results, is stricter than the young, while the "young" good woman teacher is much stricter than the old.

Explanatory factors here may be that the good old man teacher relies upon his experience, knowing where the boundary limits of his discipline are, while the good young man is not settled as to the nature of his discipline, and is also possibly unconsciously relying upon his physical and mental vivacity. He may also purposely have adopted the more modern ideal of discipline, and have had the personality to handle it. The good young woman teacher, perhaps determined by her sex, may feel that she must assert herself and hold the upper hand of the situation.

The bad teacher. Neither the young man and old bad man teacher appears to be very strict, especially is this true of the young bad man, who is exceedingly lenient. Typical answer: (young man). "No, he was not at all strict, most of the time he simply did not care."¹³

Both the young and the old woman teacher are strict, with the old woman much more strict than the young, and *stricter than any other group!* A number of sex and age factors probably enter in here.

General results are that all good teachers are "strict in discipline to a certain degree"—which from the returns appears to be apparent to the pupils, from their ruling the class, through their personalities and from a certain few fixed principles, which the children often seem to have generally "felt" more than they have been actually conscious of them, and which have been silently accepted by them as natural. "I would say she was strict in discipline. She never said much about attention, however. Her manner simply commanded respect, and so she obtained involuntary attention" (high school).

We may give the following general results: It is the bad teacher who resorts to the largest degree of physical punishments, and the old bad woman teacher uses it more than any other group, while the old man leads in "ordinary corporal punishment."

All good teachers, here recalled, used corporal punishment in rare cases—which fact seems to be in agreement with Dr. Hall's statement that "there are certain child natures, for which physical punishments cannot be entirely dropped."¹⁴

¹³One fact seems to stand out throughout this study, namely that there is a type of bad young men teachers within the school system of the United States, who seem to use the teaching profession as "a stepping stone," and whose influence upon their pupils, we may learn from our material, has been anything but beneficial. One may offer the suggestion that it be made obligatory for him to stay a certain number of years, as a secondary solution, until the wages are raised so that a teacher will find himself satisfied wherever he is placed in the system.

¹⁴It may be interesting in this connection to relate Dr. Hall's first "disciplinary case," which occurred when he, 17 years old, started teaching in a country school in Massachusetts. Some of his pupils were much larger than himself, and especially two of them had all the time before been used to being "their own masters." The first day Dr. Hall had the class, these two fellows were chewing tobacco in the schoolroom. He spoke to them about it, but they did not care. Before he left school that day, he hid a strong rod among the wood at the fireplace. The next morning, when the boys behaved as usual, he asked them to stop the chewing. They gave some obstinate remarks. A regular fight followed. Thanks to the rod Dr. Hall got the

As to general disciplinary measures used, the good teachers seem to resort to self government and the honor system, friendly private talks;¹⁵ in these ways relying upon the pupils' personalities and his own, while after school sessions, seem to mark their principal form of punishment. No good teacher sent a pupil to the office.

The bad teacher seemed to use after school sessions, sending the pupil very frequently out of the room or to the office, expulsion, punishing by grading, and to be very prone to sarcasm, scolding and threats.

To all that we hitherto have learned about the bad old woman teacher, it may be interesting to add here, that she is quite alone in regard to such disciplinary measures as: Putting the child in the closet, tying it to the chair, depriving it of personal adornments, etc.

That the kind of punishments used seems (from this study) to be a good indicator, may be of interest to supervisors and to those scientists who are trying to build up standardized estimation blanks for teachers.

THE TEACHER'S SENSE OF JUSTICE

Were the children specially favored or specially misused? The good woman teacher seems, from the returns, to have taken a personal interest in *all* the pupils and to have treated everybody on equal terms in 75% of all cases. A typical answer follows: "She took equal interest in the dullard and the dux."

In 25% of the cases the pupil had, to a more or less degree, the feeling of being specially favored. In by far the most cases, however, this was not accompanied by any discredit

upper hand, and succeeded in getting both out, shut the door and continued the lesson. The next morning they were not let in. Finally after some days they were let in on promising to behave. In short, there was discipline in that room thereafter, and the significant thing about it all is that whenever he in later life met these two men, who are now old people, they always reminded him of the event, and never failed to thank him heartily, for the beating they had gotten at the right time in their "*Schlängel-periode*." (Kindly related to the writer by Dr. Hall.)

¹⁵ Sarcasm is a trait, developing very late. For young children it ought thus to be totally banished. For the upper grade of high school it might well be rarely used, as an *art*, by a broad teacher personality and may thus be made a stimulus and an incentive for the pupil.

We think Dr. G. H. Palmer, (47) clearly has shown the *dangers* which may be implied in these measures, viz., that the teacher in executing it must not cheapen himself through "a slap on the back acquaintance."

given to the rest of the class, and was explained in terms like these:

"I was specially favored with her companionship outside of school hours."

"I felt that she thought I was her special charge (and a most troublesome one)."

"She complimented my work especially."

"I had the feeling of being given special help."

"She let me ring the bell and do other small duties."

One can take from the returns here, that the good woman teacher seems to have some peculiar womanly way of communicating her special satisfaction in, and her good-will toward, the most worthy pupils, so that it reaches its proper destination without giving it undue publicity to the class in general. This special gift, which may have its basis in the woman-nature, seems to be a most beneficial one as a real but perhaps half-unconscious stimulus to the best work of the individual of the class. The probability of this statement is shown in replies like the following:

"Sometimes I thought I was favored, but it may be because we understood each other, and I tried my very best to please her." (High school.)

The good man teacher seems to lack this peculiar subtle means of "wireless" communication, as only 15% of the pupils here report having been conscious of special favoritism. His manner of showing favoritism publishes his intentions broadcast to the world. This is evident from about all the returns which claim special favoritism on the part of the instructor. The following examples may be given:

"He would go hunting with some of the boys but never with others." (High school.)

"He always put me up as an example to the others." (High school.)

"He favored me by giving me too high marks."

"He was a special friend to me as man to man." (College boy.)

In 85% (a little more than the good woman teacher) the good man teacher treated all alike—showing a fair personal interest in all.

"The blow was as likely to strike me as anybody."

"He favored only those who worked."

"He gave a square deal to everyone." Etc., etc., etc.

The bad woman teacher. Seventy per cent (70%) report that they were not especially misused or mistreated themselves, but more than 15% of these had special favorites. Some had such strong repugnance for the personality of the teacher or for the methods used that these factors overbalanced the fact that they were merely not misused. They say:

"She had strong likes and dislikes." (High school.)

"I was not misused, but I simply did not care for her." (High school.)

"She was rather good to me, in fact, but I think she was the most partial teacher I ever saw." (High school, reported in four cases.)

"Everybody was afraid of her, although not specially misused."

Thirty per cent (30%) however, were definitely misused:

"I was misused because she did not take care in discerning the real offender in any misconduct."

"She did not take into consideration that I was a lively and active child. She wanted the old-fashioned docile child, which I was not."

"I always felt a stranger to her." (High school.)

"She did not understand me." (High school boy.)

Leaving the number given to speak for themselves, I should like to stress my general impressions upon the reading of the returns: the lack of personal *rapprochement* between teacher and pupil—the large factor of partiality—the lack of understanding of the child's character—and the overwhelming use of formal discipline.

The *bad man teacher* seems, from the returns, to differ in one special respect from the bad woman teacher. The latter seems at least by formal discipline, etc., to show some interest in the welfare of the pupils (although she very often fails in her intentions) but the bad man teacher seems to be almost apathetic even in this respect. Ninety per cent (90%) report that they were not misused (although one-fifth of these had special favorites) but they gave reasons as follows:

"He was too mentally lazy to misuse anyone."

"We couldn't find out his sense of justice because he was perfectly disinterested in anything but his salary."

The remaining minority of 10% tell of being misused in some special manner:

"He had his 'black sheep' when he was angry."

"At least he was not partial, for he misused us all."

"He took the most handy one to scold." (We probably have here the man who uses the teaching profession as a mere stepping stone.)

"I know that this teacher was disliked even more by other students than by me. I know of two concrete cases where a girl quit school, because of his crabbedness. One girl eloped with an aviator, and it came out in the papers that she had left school 'because a certain teacher made life miserable for her.' The other girl went to work as maid in a private family. She said that her work was hard, but her employer 'treated her as if she were human, and did not 'continually nag' at her."

"This teacher was discharged from the school which I attended; at which the first incident occurred. He obtained a position in another school, at which the second incident occurred, about four years later. He was let out of the second school, but is, at the present time, teaching in another high school in the same city." (High school.)

Using a little psychoanalysis on the returns here, one practical fact stands out very clearly, that every mistreatment and misuse may be a great inhibitory factor in the general school life, and also in the after school life of the child. It may be that if we could trace this factor (and associated factors) we could illuminate in another light the statement of Dewey (17): "Hardly 1% of the entire school population even attain to what we call higher education; only 5% to the grade of our high school, while much more than half leave on or before the fifth year of the elementary grade."

Dewey maintains that this remarkable fact is due to the fact that the intellectual interest does not become dominant, but that the practical impulse or disposition is in the foreground. However, from our returns we should like to have an answer to the question: How many are driven from the school through the influence of the bad teacher?¹⁶

Similar studies were made of the returns from our questionnaire in regard to the teacher's voice, the characteristics of enthusiasm and optimism, the temperament of the teacher, the teacher in relation to literature and life, the teacher's social activities and the teacher's influence upon the pupil's later life. The most important results of these studies are presented briefly in the following summary of the outcome of the whole investigation.

SUMMARY—GENERAL CONCLUSIONS

1. A review of the present paidological situation of the *problem of the teacher* reveals: The study of the teacher has, with the exception of a very few experimental attacks, on the whole hitherto been neglected out of all proportion to its significance.

2. Our study here, confirming all earlier investigations in regard to suggestion and imitation in childhood, seems to prove beyond doubt that the "teacher factor" is of paramount importance,—in fact a *condition sine qua non*, for all studies dealing with the school child.

3. Thus all mass investigations, for instance, in regard to children's ideals, their interest in the different school subjects, measuring of the schoolwork, etc., will need to be checked

¹⁶Compare the study of Book (10); 97 pupils actually left high school for the main reason that they could not stand a certain teacher.

See also the studies of Stableton: "He thinks that the small percentage of male graduates from our high schools is due to 'the inability of the average grammar grade or high school teacher to deal rightly with boys in this critical period of their school life.'" Quoted from (27, Vol. 2, p. 285.)

up with special studies, bearing as directly as possible on this teacher factor. The whole field of child study in schools will need to be worked slowly and carefully over again, with this in view. Nothing less will give us reliable psycho-pedagogical data.

Our special results, which we present as in large part merely indicative are:

I. Judging from the relative percentages of the outstanding good and bad teachers whom the recalling students have met, and comparing these with the actual number of teachers of both sexes within the school system, our results seem to justify the general demand for more men teachers.

II. The general influence of the teacher is constantly rising upwards through the school system, reaching a quite remarkable climax for the high school period.

a. *The woman teacher's good influence* on girls is greatest at 12 years of age of the pupil; *the bad influence* from them reaches its climax at 14 years of age of the pupil.

b. The man teacher has the greatest good influence upon girls at the ages 15 to 18, his bad influence upon them is highest at 14 years of their age.

c. At 14 years of age of the pupil (freshman year in high school) we find: *Very few good teachers, and the very greatest number of bad both men and women teachers*, which result may point to the necessity of the Junior High School, with broadly and specially trained and well selected teachers.

III. a. The most efficient man teacher seems generally to be found from 25 to 35 years of age. For girls his median age is 35.

b. The best woman teacher seems to have a wider range, from 20-40. The relative discriminating point for good and bad woman teachers seems to be 30 years of age.

c. The good teacher is, throughout this study, generally relatively younger than the bad.

d. The age of the good teacher seems to vary very little with the rising age of the pupils up through the school system. (See tables.)

IV. We get a clear impression of the significance of the dynamic-emotional abilities in the teacher's personality. "The sympathetic touch" may give a transferring help even in a purely intellectual subject like mathematics.

a. *The English teacher* (as also English as subject) has the greatest good influence in mental character training, and may have a considerable bad influence (especially in high school).

b. The science teachers may have a relatively great good influence; in this study, however, the bad influence from them seems almost doubly as big as the good.

c. Foreign language teachers seem to rank high in the high school, while teachers of history, in this study (as in my Norwegian one), seem to have a low standard from the point of view of character building.

V. Personal pulchritude, neatness in dress and good manners are essential factors in the teacher's personality, and correlate very high with excellence of the teacher in the public schools.

VI. The good teacher's voice is given as: Medium in pitch, smooth in quality, and moderate in volume.

The bad female voice is designated above all as nervous, the *bad male* voice as feminine. The teacher's voice has been a *very essential factor to all recalling students*.

VII. Enthusiasm and optimism (as we have defined these traits, seem to be absolute attributes of a good teacher, being present to a more or less degree in all recalled good teachers.

VIII. In all cases covered by our data the good teacher seems to be of flexible nature, able to suit different situations, however, with a predominance of joviality, and sense of humor, as a general background. The good grade teacher must possess the ability "to let himself go" occasionally in unrestrained "fun" with the children.

IX. All good teachers recalled are designated as self-controlled, a trait apparent to the pupils in various ways.

X. Eighty-nine per cent of all recalled good teachers were listed as bringing the pupils in touch with actual life in various ways. Formal teaching, and little or no attempt at education, characterizes the bad teacher.

XI. The good man teacher over 30 years of age seems to be more strict in discipline than the young; while the good young woman teacher is much more strict than the old. The old bad woman teacher is more strict than any other group, and uses *physical punishment* in 3 cases out of 8. All good teachers here recalled used corporal punishments in rare cases. The art of punishment used by the teacher is a good indicator for judging thus the general good and bad influence from him.

XII. The teacher's *sense of justice* is a trait apparent to the pupils in various ways. Mistreatment and misuse from the side of the teacher may be of *determining* influence not only on the child's school life, but also on its whole future.

XIII. Approximately every second good teacher visits the home of the pupils.

XIV. There seems to be a high correlation between all good teachers and their social activities with the pupils. Men seem to be more active than women, in this respect.

a. Athletics and sport ranks highest.

b. High school woman teachers' informal walks (whenever the pupils were allowed "free talk") are stressed as having been of very great value to girls of 14 to 18.

XV. Every good teacher has been associated more or less clearly with a life ideal, which stands out for the recalling students, as one intimately incorporated in the teacher's personality. In 40% of all cases also orally stressed "maxims" had been taken to heart by the pupils and had been guiding principles at work for from 1-12 years! This fact supports the plea for systematic "moral training" like the French (combined with the right teacher personality) for the grade and high school.

XVI. As to the lasting effect from good and bad teachers on the pupil's later life, this seems to be of vital importance in to the pupil's choice of vocation in leading their interest in a certain good direction, in helping them to overcome innate character difficulties, etc., etc.

XVII. The influence from good and bad teachers reaches far beyond their own activities—in the positive and negative effect they may have on the *coming generation of teachers*. This points to the necessity of good teachers in Normal Schools and in all other training schools for teachers.

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THE TEACHER AND HIS IDEALS

By HERBERT H. GOWEN, University of Washington, Seattle

It is an oft-quoted saying of Bernard Shaw that 'those who can *do*, and those who can't *teach*.' It is a characteristically Shavian and somewhat brutal epigram, but it bears witness to the disconcerting fact that the teacher is not yet appraised by society at his full value.

History has done surprisingly little to spread the fame of great teachers. Even Aristotle, famous as philosopher, was, as teacher, less famous than his royal pupil, Alexander. Dante has indeed shed some reflected light upon his schoolmaster, Brunetto Latini, but it is lustre of a rather lurid kind. We see him in Hell, smirched with fire and appealing to his pupil to preserve the memory of '*Il Tesoro*'. Shakespere has done no more for his Stratford pedagogues than to give us the picture of Sir Hugh Evans in the '*Merry Wives*'. And, if others have refrained from consigning their instructors to an Inferno of one kind or another, they have not, on the other hand, provided large space for them in any Campo Santo or Westminster Abbey.

This scant appreciation shown by the historians is justified materially by the slender pecuniary reward which awaits even the highly successful teacher. Civilization, which so lavishly remunerates the impressario of human follies and frivolities, and pours out gold like water at the shambling feet of a 'Movie' favorite, has seen to it that its sympathy with the teacher takes a less substantial expression than the financial. This is, of course, nothing new. Four centuries ago, in 1515 (to be precise), there was born one of the most illustrious teachers, Roger Ascham, author of '*The Scholemaster*.' You will recall the story of the interview, towards the close of his life, with Queen Elizabeth. Ascham had gone to apply for a pension and in his petition he left a good space for the figure which Her Royal Grace, he hoped, would insert. The space, he remarked humorously, was much too large for a *decemit* (in pounds), or even a *viginti*. He was hopeful for a *quadraginta*, or an *octaginta*, which would have fitted well. Alas, the Queen contented herself with a beggarly *viginti*. Yet, when the old man died, Her Majesty declared that she would rather have cast ten thousand pounds into the sea than have lost her

Ascham. This goes to show that the market value of teachers, which descends with age, rises considerably with death. Many of us, no doubt, would gladly be paid to-day on the evaluation made one day after death.

Now perhaps the most unfortunate result of this comparative lack of present appreciation is that it frequently begets self-depreciation and even a kind of self-contempt in the teacher himself. It is no rare thing, I fear, to find a certain apologetic attitude on the part of those who are serving the state by teaching the young. Instead of magnifying their function we find a disposition in many, on some slight provocation, to renounce their vocation and pass out of the ranks of the profession. In the case of that large number of teachers who belong to the fair sex, there is an uncomfortable suspicion that Mr. Gayley's description of 'a mob of mobile maidens meditating matrimony' is not far from the truth. In the case of the lamentably small number of men attracted to the teaching profession we find not a few escaping at the first opportunity into official and administrative work. It is always a sad thing when a man loses the sense of vocation, when the ideals which once awakened enthusiasm and braced men to endure hardness turn to Dead Sea fruit and beget despair and disillusion. And nowhere is this loss of vocation more tragic than with those who, after having aspired to mould into fair forms the plastic mind of youth, have come to see in their work only an ill-requited drudgery.

In pleading for a higher courage and a nobler vision than are sometimes suggested by experience, let me ask your recognition from the outset of the fact that the teacher must always be prepared to find his wage less than his worth, and even contemplate as inevitable a certain self-sacrifice which more material callings need not demand. You make boxes at a factory and it is easy to determine their exact value and make the wage accordingly; you teach, and the results must be judged not in time but in eternity. Who can prescribe an adequate wage for work which is so largely secret and beyond the judgment of men? Who can estimate aright results which are so frequently posthumous and remote? Justly did Browning select the Grammarian as his illustration of the 'high man,' contrasting with the 'low man' who succeeds so definitely in the material thing he has set himself to achieve. Therefore, who so fittingly as the teacher deserves the lines:

'Lofty designs must close in like effects:

Loftily lying,

Leave him still loftier than the world suspects,
Living and dying.'

No teacher who is worth his salt but will envisage this fact from the beginning and so avoid making his circle premature or entering port too soon.

Out of the spurning of low ideals, because of the knowledge that nothing so soon disgusts as the things which are easily realized, will grow the courage which will never flag in the presence of the challenging heights. The conception of a profession as a newspaper puff or as a meal-ticket will soon cease to attract. '*Inspexit et despexit*,' is the description of S. Bernard's victory over a certain temptation. But it is necessary to go on to something more positive.

To begin with, courage will rise as the teacher comes to understand that the work of a teacher, ill-requited as it may be, is one of commanding influence within the community. It may seem paradoxical, but it is true to say that the smaller the community the greater the influence. Take, for example, the work of one teaching in small rural towns and villages. In the middle of the 18th Century Shenstone wrote '*The Schoolmistress*' in which he described the old dame 'in lowly shed and mean attire,' before whose thatched cottage grew conveniently 'a birchen tree,' and who ruled her little world like a queen. Closer home, we have the immortal picture of the school-mistress in the '*Autocrat*,' whose fortunes we follow from the time when she comes down with a rose in her hair and one in each cheek to the time when she consents to take the long walk with her lover and receives from Benjamin Franklin the wedding present of a Cupid caught in a mouse-trap. And what wealth of material for literature there is to-day in the story of the young girls who go out from home and Normal school, trembling with the sense of strange responsibility, yet bringing into the environment, unfamiliar and even rough and uncouth, the grace of a culture which is almost royal in its opportunities! There is something almost magical in the influence which transforms a young girl, in the course of a few weeks, into a power which is not only the standard of intellectual ambition but the arbiter of fashions and proprieties generally, despotic alike in dance and prayer-meeting, mighty to subjugate paganism (in the literal sense), and to twist school-directors to its will,—until the inevitable occurs and the little teacher goes as a bride to other service. I might take similarly other types and have no difficulty in showing that, outside as well as within the duties of the profession, the teacher is performing a service which leavens society through and through and entitles the most despondent of pedagogues to lift up his head and be of good courage.

I would, however, have the teacher go a little further than

in the regaining of courage. Courage is a great thing, even when it is stolid and passive. 'A noble aim faithfully kept' says Wordsworth, 'is as a noble deed.' Nevertheless, there are among the courageous too many of those whom Dante calls

'le gente dolorose
Ch'hanno perduto il ben' dell' intelletto.'

We need to stimulate to new endeavor that zest which can only come from joy in the sense of things worth doing and therefore done with pleasure. Do teachers always remember that the word '*school*' means '*leisure*'? Perhaps it is hard to believe this to be the fact. But it is true. The Greek word '*scholē*,' or '*leisure*,' was employed because the proper work of a school is to eliminate from life that drudgery (*kopos*) which is the feature of servile work. Intellectual work, if it is excellently done, must be done with a zest which makes it accomplished with ease. The worker must use his tools as the Chinese butcher used his knife. He knew (says the story) the joints so well that he cut up his carcasses year after year with a knife which never needed sharpening, because it never encountered unyielding tissue. Of course there must be work, but it should be work from which all the toil has been excluded by love, till every trace of work has been obliterated in the finished product.

Our schools generally afford wonderful testimony to the fact that, up to a certain point, our teachers have found pleasure in teaching. We see sometimes a fierce earnestness in the gaining of efficiency which is even a little pathetic. There is an ardent desire to make the work technically perfect and so to analyse the powers which make for success as to command success at will. That is good so far as it goes. It is good without qualification if the use of the faculties which are thus improved become in time natural and unconscious. But it is bad if all that is done is to turn the teacher into a useful machine, a kind of educational Ford, whose efficiency must be kept up by a little lubrication here or the tightening of a screw there. God help the teacher whose technique is always kept in full view of the public! He might as well be that old Chinese Emperor who had a glass front to his body so that he could always have an eye to the working of his digestive system. It is, of course, inevitable that much of a teacher's training should deal with technique, but I would press this opportunity to demand something more. This something is that which concerns the teacher directly as a *person*. I hold that the experimental method of advancing

education has justification only when it retains a personal conception of the teacher—and of the taught.

Teaching is, in the first place, not the parading of so much information before an assemblage of young people rendered potentially receptive by the possession of ears, eyes, and (alas) note-books. If this were so, a procession of sandwich-men with suitably inscribed boards might be as effective and more picturesque. Instruction by phonograph might even be cheaper and more consistently standardized.

Nor is teaching mere methodology. Education is not to be reduced to a card-catalogue or to a system of mnemonics. There is something pathetically futile about the teacher who has succeeded in making himself a mechanically perfect classroom accessory. The artificiality, the pose, the pretence, the veneer, which may pass the inspector and even perhaps win his enconiums, are all so easily detected by those most clear-sighted of individuals, the children. They penetrate easily the mask which is worn until it becomes all but the natural expression. The assumed moral indignation is so easily translated into a form of personal resentment. The cocksure assumption of infallibility, which must never acknowledge error, is so easily summed up as the worst form of ignorance. The following verse may be out of date in detail but it is true in substance:

"With emphasis a trifle strong
I said it was completely wrong.
Again he puts it. Then I storm
And make him stand upon the form.
Then he commits the self-same sin
A third time, and I keep him in.
To get it right he still declines,
I give him several hundred lines.
He makes the same mistake again;
Then comes my last resource, the cane.
I've look'd the matter up to-night,
And find the little beast was right."

If teaching, then, is neither the administration of information in duly regulated doses, nor the practice of an approved technical method, what is it? Sometimes it is convenient to get a little help from comparative philology.

The word '*teach*' is to be traced back to a Sanscrit root, '*diç*,' 'to point out.' The verb is the same as the Greek '*deiknumi*,' and the noun '*digit*,' or 'finger,' is one of the derivatives. Now 'pointing out' differs from mere telling in that it includes much else beside the creation of the channel through which information may enter the mind. There is

necessary the creation of the very organs by which observation is possible. There is, of course, in the first place, that training of the power of observation which we associate especially with the method of Agassiz. He would, we are told, put a fish into the student's hand and gradually draw forth from his pupil's observation every thing there was to learn. This principle of '*Venez voir*' is of sufficient importance in itself.

But the creation of the very power to observe goes much further. It gives extension to the limitations of the mind as a pair of spectacles will add to the range of impaired organs of vision. This is what in theology we call '*grace*,' and the good teacher must make his teachings, in a very real sense, 'a means of grace.' One of the greatest of ancient teachers was Alcuin, and some of you will recall a beautiful letter which he wrote to the Emperor Charlemagne in which he stated that, though his employments were in a humble sphere, they were neither ignoble nor useless, since he spent his time in teaching the noble youth around him and *inspiring them with a taste for learning*. This is what I mean by the imparting of grace. It is the supreme miracle which the teacher is empowered to work,—to open the blind eyes to the illimitable majesty and greatness of the universe. It is the supreme triumph of the teacher when he can take his place among those who are walking darkling amid solidest eternal things with the result that here and there a pupil cries out, like the man in the Gospel, 'One thing I know, that whereas I was blind, now I see.*'

* Rabindranath Tagore's experiment of an '*ashram*' at Bolpore is not translatable, probably, into the educational system of America, but there is suggestion as well as inspiration in his description of the all-too brief career of his assistant, Satish Chandra Roy:

"With him boys never felt that they were confined in the limit of a teaching class; they seemed to have their access to everywhere. They would go with him to the forest when in the spring the *sal* trees were in full blossom and he would recite to them his favorite poems, frenzied with excitement. He used to read to them Shakespere and even Browning,—for he was a great lover of Browning,—explaining to them in Bengali with his wonderful power of expression. He never had any feeling of distrust for boys' capacity of understanding; he would talk and read to them about whatever was the subject in which he himself was interested. He knew that it was not at all necessary for the boys to understand literally and accurately, but that their minds should be roused, and in this he was always successful. He was not like other teachers, a mere vehicle of text-books. He made his teaching personal, he himself was the source of it, and therefore it was made of life stuff, easily assimilable by the living human nature. The real reason of his success was his intense interest in life, in ideas, in everything around him, in the boys who came in contact with him. He had his inspiration not through the medium of books, but through the

Machiavelli used to say that brains were of three orders; one was that of those who could learn of themselves; a second of those who could learn through the instruction of others; and the third was of those who could learn neither of themselves nor through the teaching of others. The real teacher is he who succeeds with this apparently hopeless third class. The story is told of a tortoise, which someone had kept through the winter in a cellar, awaking from its hibernation one fine spring morning when the maid-servant went down for a bucket of coal. The girl came back shrieking, 'Oh, ma'am, the block I've been breaking coal on all winter has just come to life and is chasing me up the stairs.' Such miracles will occur in the school-room and the teacher must himself work the annual miracle of the spring by making those who have appeared to be but chopping-blocks awake to an active intellectual life. A more literary illustration will be found in Mr. Percy Mackaye's drama, *The Scarecrow*, where the poor thing of shreds and tatters comes at last, through the influence of love, to demand for himself a soul. In like manner, where the good teacher has intervened effectively, the veriest school-room Pumpkinhead may be awakened to outwit the devil.

If we can conceive of such miracles as within the reach of the teacher's art, we shall understand how much room there is for what we call, for want of a better name, *Suggestion*. What we call will-power is properly suggestion, the determined holding of an ideal before the mind of others till action follows. Environment itself is a form of suggestion exercised on the part of a whole community. The imparting of love is a form of suggestion, the most powerful that can operate in teaching. Shakespere, who is well-nigh infallible as psychologist, has shown us the very best kind of pupil in the lines:

"An unlesson'd girl, unschool'd, unpractis'd:
Happy in this, she is not yet so old
But she may learn; and happier than this,
She is not bred so dull but she may learn;
Happiest of all is that her gentle spirit
Commits itself to yours to be directed,
As from her lord, her governor, her king."

direct communication of his sensitive mind with the world. The seasons had upon him the same effect as they had upon the plants. He seemed to feel in his blood the unseen messages of nature that are always traveling through space, floating in the air, shimmering in the sky, tingling in the roots of the grass under the earth. The literature that he studied had not the least smell of the library about it. He had the power to see ideas before him, as he could see his friends, with all the distinctness of form and subtilty of life." (*Personality*, pp. 171-2.)

That might be embarrassing to the teacher if too literally true, but it is, nevertheless, a fact that the teacher must succeed in kindling some kind of corresponding emotion, or many channels of access to the mind of others will remain sealed.

It is evident from this that teaching involves the play of personality upon personality to an extent which we seldom realize. The best teacher must be he whose personality, natively strong, carefully trained, well-balanced, kindled and prophetic, plays upon the receptive and holds them as the Ancient Mariner held the Wedding Guest with his glittering eye until his tale is told.

This is a big task and, instead of depreciating the teacher's function, we may well say, 'Who is sufficient for these things?' We may not wholly succeed, but we must keep trying. I cannot forget what a Senior said to me a little time ago, 'Oh, if only our professors could make us feel in our freshman year what we get to feel for ourselves as Seniors.' Oh, if we could! You will recall that wonderful story of Daudet's in the '*Contes de Lundi*,' '*The last lesson*.' The tardy scholar drops into the Alsatian class-room at the hour when his old teacher is giving his last lesson in French. On the morrow the German is to take possession of the land; this is the last chance. How wonderful is the emotion, the attention, the strained silence! How much is learned as never before, ere the teacher, with tears streaming down his cheeks, writes upon the black-board, '*Vive la France!*', and surrenders his charge! It is reserved, as we think, for the rarest of circumstances to create such an atmosphere as this. But the spirit of the teacher ought to be able to create it day by day. When this is the case, his words become as oracles and everything is graven indelibly on the mind.

I repeat, this is a big task, a man's task,—one that demands the utmost freshness, strength, patience, enthusiasm and an unflinching faith. We may not always rise to it, but we must beware of the danger of falling below the level. A military officer has said that he always knew when he was in proper form, because otherwise he found his men drilling him when he was supposed to be drilling them. We too know as teachers when the initiative has passed out of our own hands through the failure to inspire. The transition from the one plane to the other is always tragic and often fatal.

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To what ends is all this toil of body and mind and personality?

1. *First*, as I have already said, it is to give vision. In

R. L. Stevenson's *'Will o' the Mill'* we have the story of the boy brought up in the narrow circle of the village, yet fired with the longing to cross beyond the rampart of hills which walled him in. Then we are told how there came one who made the outlook commonplace and crushed down the aspiration. So life flowed on, sordidly, till the great storm came and with the storm the hearse-like carriage, with Death as the driver, to deliver his soul from prison. The parable is a good one to remember. Death does indeed come at the last to restore us the vision we have lost. But life ought to keep the vision all along,—the sense of abounding freedom, range, possibility, enlarging faculty,—and the teacher must be ever bent on making the lives he influences fuller of content, delivered alike from the torpid existence of the materialist and from the feverish excitement of the voluptuary. Any study may be made the door of entrance into the Infinite, so that the pupil may learn, with Blake,

"To see a world in a grain of sand
And a heaven in a wild flower,
Hold infinity in the palm of your hand
And eternity in an hour."

2. *Secondly*, it is to inspire the work which shall transform vision into reality. Théophile Gautier tells us he knew only one line of Wordsworth, that which speaks of

"Spires that with silent finger point to heaven,"

but often as he sat, dull and depressed, and unable to work, he would find himself scribbling on the paper before him

"Group after group of heavenward-pointing spires."

So the Muse was propitiated and work was resumed.

So must the vision of the teacher produce work for himself and for the taught. Education, as someone has remarked, must never degenerate into a game of 'ring around the rosey.' The same power of personality which enables the student to behold the teacher's visions must enable him also to follow his leader in enduring hardness.

3. *Lastly*, it is to inspire to high human use of what is envisaged and translated into work. The final use may be beyond all power of observation. It will certainly transcend all that was in the text books, it will follow roads beyond even the teacher's ken; it may even completely supersede the instruction given at the start. But it will earn the right to find in the summing up all the value of the way. The prize will be in the process as well as in the goal. The justification for it

all will be found, not in the grading of jobs or in the estimation of increment of salary, but in the enriched tissue and the enhanced perdurability of life.

* * * * *

In the final result the teacher will have a very real share and will be permitted, *ex dono pupillorum*, to know his reward. There is in Holy Writ a promise, 'Thine eyes shall see thy teachers,' and I take it that this is a prophecy of that final fellowship which shall come at last in the full mutual recognition of the relation of the teacher and the taught. To some unworthy ones the prospect may be dreadful indeed, a veritable Day of Judgment, in which their work shall share the fate of the wood, hay, stubble and the waste things of the Universe. But to those who have maintained faith in their calling and have fought unflinchingly the good fight, there will be such joy and satisfaction as shall shed undying glow over the past and present and shall make the future glorious with hope.

INSTRUCTION IN MATHEMATICS FOR GIFTED PUPILS¹

ELIZABETH FRAYER BURNELL

Before outlining a course in mathematics for gifted pupils, an investigation was made of the provision of our public school system for students of unusual mental ability. A surprising dearth of literature on the subject was revealed. Periodical articles and Board of Education reports discussing this subject are so obscurely indexed as to be almost inaccessible. One of the most comprehensive discussions of the problem of the gifted child appears in a superintendent's report,⁽¹⁾ indexed as "Special classes for backward and feeble-minded children." Detroit avoids the misinterpretation of the term "super-normal" and reports "special advanced classes." In the report of the McKinley Preparatory School, Lincoln, Nebraska, there is no obvious heading to indicate that it was organized for pupils of superior mental and physical qualifications. Superintendent Condon of Cincinnati has recently announced a "Special Academic Class" to be organized September, 1917, "for pupils of unusual mental ability and sound health." Even a superficial visit in the Detroit schools revealed classes organized for the acceleration of small groups of pupils in the elementary grades of which there was no report available in the superintendent's office. The following investigations indicate the development of this educational problem during the last six years.

1911. Provision for exceptional children in the Public Schools. (Van Sickle, Witmer and Ayres. U. S. Bureau of Education Bulletin No. 14.) Only five cities are reported as known to have classes for exceptionally gifted children: Baltimore, Indianapolis, Lincoln, Rochester and Worcester.

1912. School organization and the individual child. (W. H. Holmes.) An exposition of plans that have been evolved to adapt school organization to the needs of individual children, normal, super-normal, and sub-normal. "Promotion classes for gifted pupils," p. 138. Discussion of the acceleration of gifted pupils in Baltimore and a list of cities which made similar provision on the order of the "six-six" plan.

¹This investigation was carried out under the direction of Professor Charles Scott Berry, at the University of Michigan, in 1917.

1912. A year's work in a "superior" class. (Flora Unrich, *Psychological Clinic*, January.) Report of a class in the eleventh school district, Cincinnati, Ohio, consisting of thirty-two pupils of whom seventeen were prepared for the fifth grade, nine for the fourth grade, and the remaining six moved away or were returned to their respective rooms. There was a gain of one year for twenty-five pupils who did two year's work in one.

1912. Some studies on "abnormally intelligent" pupils. (Yasusaburo Sakaki. *Psychological Clinic*, March.) Report of the examination of all the children in the larger normal school at Fukawka in Japan which found 79 out of 332 to show advanced degree of intelligence. These children were classified according to definite types into seven groups and it was found "that only one class of abnormally intelligent children was perfectly free from any pathological taint and that these were the only children who possessed stability of nerve power and who exhibited a uniformly progressive mental and physical development . . . the others being children of the 'nervous type,' precocious children, children mentally advanced but deficient in physique, etc. . . . Our experiments and their results serve to convince us that there is urgent need for reform in the present system of class making."

1912. Seven years with unusually gifted pupils. (Frederick E. Downes, Harrisburg, Pa. *Psychological Clinic*, March.) Before revision of the course of study it was found possible for gifted pupils to complete the second and the sixth grades in less time; 350 skipped in one year. In 1910-11 two schools were established exclusively for bright children and in 1911-12 there were three such schools in which the children completed the eighth and ninth grades in one year.

1913. Special classes for bright children in an English elementary school. (I. Shaer. *Journal of Educational Psychology*, April.) A diagrammatic representation of various types of promotion is given.

1913. The physical status of the special class for bright children at the University of Pennsylvania Summer Session, 1912. (*Psychological Clinic*, March.) "The conclusions to be drawn from the experience of the summer school are that when due attention is given to such matters as diet, rest, exercise, home surroundings and physical conditions, the life of the school may foster physical improvement and well being as it has been made to serve the purpose of intellectual progress."

1914. A study of exceptional children in New Orleans. (*Psychological Clinic*, p. 232, Jan.). A preliminary census was organized in 1912 to determine where and how many children of five exceptional types were to be found. Special classes recommended for gifted children.

1914-15. Special classes in Michigan for mentally exceptional children (C. S. Berry, Report of Supt. of Public Instruction, pp. 57-75). Discussion of the arguments for and against the formation of special classes for gifted pupils.

1916. Announcement of the appropriation by the General Education Board for the use of Professor Guy M. Whipple, of the University of Illinois in the study of gifted children. Professor Whipple will endeavor to find out how early in their school life gifted children can be distinguished and how much school time and energy they can economize as well as how much additional training and mental equipment they can obtain through their school years. (Note. *Elementary School Journal*, September.)

1917. Announcement of an appropriation by the General Education Board to provide Teachers College of Columbia with funds necessary to establish and conduct a school for the purpose of constructive work in the reorganization of elementary education. "The subject of mathematics will receive special consideration in the hope of working out a rational course of study which connects the study of mathematics with its use, and which also makes adequate provision for those who have special ability or desire for this subject." It is expected that the school will open with part of its classes in the fall of 1917. Both boys and girls from six years of age and up will be admitted. (*Elementary School Journal*, February.)

1917. Report of the experiment undertaken jointly by Teachers College and the New York City Board of Education at Speyer School. Beginning with 1915-16 there were admitted to the school 200 seventh grade boys who indicated, with the approval of their parents, their intention of taking the Latin course in high school. These boys were divided into classes of 25 each on the basis of extended mental and educational tests, supplemented by the subsequent judgments of their teachers. The aim was to secure as nearly homogeneous groups as possible and to adjust the work of the class to the capacities of the pupils. . . . The brighter groups will undoubtedly be able to do three years' work in two, while the *duller ones will have gained a better mastery* of the material than if they had been swallowed up in the ordinary mixed class. This attempt to employ mental tests in securing homo-

geneous groups is a significant step in educational procedure. (*Journal of Educational Psychology*, March.)

1917. The Arlington Plan of grouping pupils according to ability in the Arlington High School. (Frederick E. Clark. *School Review*, Jan.). Discussion on the basis of six years' successful operation in Arlington, Mass.

1917. The Supervisor's use of standard tests of efficiency. (J. Coyce Morrison. *Elementary School Journal*, Jan.). "*The bright pupils need if anything more attention than the slower children.* On the basis of these tests during the year several pupils have been permitted to skip a grade. . . . There are 18 others who are receiving special attention from teachers in order that they may be able to do three years' work in two years. . . . Arrangements have been made whereby one teacher can give at least one third of her time next year to the coaching of accelerate and backward children. She will take *special training* during the summer for the work and will co-operate with the regular teachers in caring for these special pupils. The *majority of her time* will be given to the *brighter pupils.*"

In order to determine the present situation in regard to school provision for bright children the following questionnaire was sent out in April to the Superintendents of Schools in the cities indicated.

1. What provision are you making in your school for exceptionally bright children?
2. How many special teachers of Arithmetic have you in the elementary grades?
3. Have you a supervisor of Arithmetic?

The replies to question 1 were as follows:

Atlanta, Ga.—"Semi-annual promotions and opportunity to advance as rapidly as possible."

Baltimore, Md.—"Promotion at any time. In many cases children complete the eight year course in seven years."

Boston, Mass.—"Rapid advancement classes." Started in 1913.

Chicago, Ill.—"No provision."

Cincinnati, Ohio—"Special academic class" announced for Sept., 1917. "No other provision."

Cleveland, Ohio—"Advancing by division and by individual promotions as rapidly as possible."

Detroit, Mich.—"Special advanced class. The aim is not to hurry the children through school by covering ground more rapidly but to give fuller, richer courses." Started Sept., 1915.

Harrisburg, Pa.—"Special schools for these pupils for sev-

eral years when we had a nine-year elementary course. Since we have had an eight-year course we have not maintained separate rooms and teachers for these pupils. Now we use the fast and slow section method."

Indianapolis, Ind.—"In the lower grades we try to group children according to their capacity and allow them to progress as fast as they can do the work satisfactorily. In the upper grades we frequently select classes of unusually bright children and permit them to do two years' work in one and one-half years or thereabouts. Since our grades are but one-half year apart in their work we frequently permit individual pupils or groups of individual pupils to do the work of two grades simultaneously when this arrangement can be made."

Kansas City, Mo.—"Seven year elementary school organization makes it possible for the exceptionally bright children to save a year's time."

Lincoln, Neb.—"McKinley Preparatory School established in 1909, provides for exceptionally capable children."

Los Angeles, Cal.—"They are always given opportunity to work ahead in the next grade and are encouraged to do so. We also have *ungraded classes* in which bright pupils may work ahead."

Nashville, Tenn.—"Principals may promote children at irregular times if they believe them capable of doing advanced work."

New Orleans, La.—"No special classes. Special promotions on recommendation of teacher and principal."

New York City—"No special provision except to allow principals to organize classes for rapid advancement. Each principal is at liberty to have a teacher take her class over three terms' work in two terms."

Oakland, Cal.—"We have formed a few classes in the upper grades where we try to secure more than the normal rate of promotion."

Philadelphia, Pa.—"No special provision except that children may be promoted at any time during the year. Last year there were 6,545 incidental promotions of this kind during the two terms."

Rochester, N. Y.—"We have a number of classes for the exceptionally bright children in various schools and in one of our high schools."

St. Louis, Mo.—"No special classes but opportunity for rapid advancement through frequent individual promotions and by means of quarterly promotion scheme."

San Francisco, Cal.—"We let them cover two grades in a year if their progress and ability justifies this."

Seattle, Wash.—"We have auxiliary teachers in a number of the buildings who assist pupils capable of making up a semester's work. In all schools exceptionally bright pupils receive additional help in order that they may advance as rapidly as they are able."

Washington, D. C.—"Exceptionally good pupils from the seventh grade whose parents are willing for them to do extra work, and whose teachers recommend the trial are given the opportunity to make the eighth grade in half a year. The most of these are able to do so without difficulty." Special class organized in 1912.

Worcester, Mass.—"At the end of the sixth grade work we offer Latin and French or German to brighter pupils in addition to their regular work. Less attention is given to technical English grammar."

Of the twenty-three school systems, thirteen cities specifically indicate special class organization. Chicago is the only city to report no provision. Detroit alone emphasizes the general development of the gifted child rather than acceleration of his school work. The provision made by the remaining twenty-one cities for bright children may be summarized by the following six types in all of which economy of time is an important if not the primary object.

1. Special ungraded classes. (Los Angeles.)
2. Auxiliary teachers. (Seattle.)
3. Introduction of additional work into the elementary grades. (Worcester.)
4. Rapid advancement classes. (Boston, Cincinnati, Indianapolis, Lincoln, New York City, Oakland, Rochester, Washington, D. C.)
5. Fast and slow divisions. (Cleveland, Harrisburg.)
6. Irregular promotions. (Atlanta, Baltimore, Kansas City, Nashville, New Orleans, Philadelphia, St. Louis, San Francisco.)

Public sentiment in favor of making any provision for exceptionally bright children has been slow in developing. In April, 1915, the Michigan Superintendent of Public Instruction sent out a questionnaire to the school superintendents of all cities and towns of Michigan of 1,000 inhabitants and over, and included the following question:

"Do you believe in the formation of special classes for exceptionally bright children? Give reasons for your answer."

Dr. Berry has made a detailed summary of the replies with arguments for and against such grouping(1). Of the 217 replies only 58% advocated organizing such classes, 23% were

opposed and the remaining 19% were undecided or failed to answer.

In April, 1917, thirty-five teachers representing grades from the first through the eighth, and twenty-one teachers of high school mathematics replied to a questionnaire relating to the grouping of pupils according to ability. Of these fifty-six teachers, fifty expressed the opinion that grouping would be to the advantage of pupils of superior ability and six were opposed to such grouping. Thirty-two teachers thought that pupils of less ability would benefit by such groupings, twenty-two believed that it would not be beneficial, while two were doubtful. The replies from these fifty-six teachers indicate considerable scepticism in regard to the benefits derived by poor sections as a result of grouping and much experimental evidence is needed to confirm that of schools which have already found grouping successful. The report of the Speyer School, New York City, (*Jour. of Ed. Psy.*, 1917, p. 182), is significant in showing that the duller groups as well as the superior pupils gained as a result of this grouping. In the Arlington plan of grouping pupils(4) in slow, average and bright sections it was found that the slow and bright sections benefited while the average sections probably neither gained nor lost. In 1912 the Ann Arbor High School experimented with a class of failures, but did not regard the grouping as a success and similar experiments have not been tried since. In the High School of Cass City, Michigan, at the end of the first semester, this year, a class was made up of failures in plane geometry and the grouping was found to be beneficial. Grouping according to ability has been reported in Menominee, Michigan, and in Ithaca, New York. While interest is being shown by teachers in the elementary and secondary schools in the question of grouping, University professors are less ready to recognize the existence of a similar problem relating to freshmen students.

With the whole question of grouping still in the experimental stage it is not surprising to find that little has been done in determining the most advantageous grade for the introduction of grouping. As far as reports at hand indicate classes are not now being organized for children of superior ability earlier than the seventh grade. The McKinley Preparatory School, Lincoln, is made up of pupils from every Sixth A and Seventh B grade in the city. The "advanced classes" in Thirkell School, Detroit, are doing seventh and eighth grade work. The question of the organization of such classes earlier in the elementary grades seems not to have been considered in Detroit. The two teachers of these special

classes at Thirkell School do not advocate such grouping earlier than the sixth grade even though it might be possible to surmount the difficulties which are obviously very great in a city the size of Detroit. It is significant, however, that of 35 teachers representing all the grades from the first through the eighth, three who thought grouping according to ability would not be to the advantage of superior pupils were seventh and eighth grade teachers. With the growing emphasis on the early education of the child, it would seem logical to introduce grouping much earlier than has yet been done.

Closely involved with the problem of the grouping of bright children is that of the size of the group. The replies of fifty-seven teachers to the following question indicate the wide divergence of opinion and the necessity for experimentation:

"How small a class of exceptionally bright pupils would you consider ideal for accomplishing the most for the individual?"

- 1 advocated class 6-10.
- 20 advocated class 10-15.
- 30 advocated class 15-20.
- 5 advocated class 25-30.
- 1 advocated class 35.

The classes in Thirkell School, Detroit, and in McKinley Preparatory School, Lincoln, are each twenty-two in number. The special class in Washington, D. C., has forty pupils.

While the question of grouping according to ability, the size of the group, and the age for introduction of grouping are problems of prime importance from an administrative standpoint, perhaps none is so fundamental for the development of the gifted child as the problem of the content of the course itself. The conservative fear any attempt to crowd a precocious child in his school work. The reformers are urging the necessity for greater economy of time.

It is significant that of the twenty-three school systems listed in answer to the first questionnaire, Detroit is the only one in which emphasis is placed on "providing more material and covering it more rapidly," as quoted from the report(5) of Miss Elizabeth Cleveland, director of the "special advanced class." If it is desirable that these special advanced classes be organized chiefly with a view to saving time, then the course in mathematics will obviously not differ in amount from that ordinarily given. If, however, the grouping of bright children is introduced in the first elementary grade, there will be involved a correspondingly greater conservation of enthusiasm, interest and energy as well as of time and it

should be possible to enrich the course in many directions. Under such circumstances it would be possible to modify the instruction in mathematics more effectively than even the most ambitious reform is now attempting for non-homogeneous groups.

One of the problems which the precocious child has to meet is that of being associated with older and more mature children with whom he is not altogether companionable. Anyone who has followed the careers of the precocious children who have been much discussed in the papers (6) must feel dubious about the scheme of education of which they are demonstrating the results. By grouping children of exceptional ability during their secondary school education this problem will obviously be merely postponed until they complete their high school course. Parents will then need to provide a solution for the next step in the education of the child whose acceleration has prepared him for the University much younger than the average. The opportunities for the symmetrical and harmonious all-round development of the child, which Miss Cleveland hopes to provide in the "advanced classes" at Thirkell School, and which the Phebe Thorne Model School, Bryn Mawr, Pennsylvania, offers for the normal child are a happy solution of this particular problem. On the other hand, economy of time is urged by Dr. Flexner in "A Modern School." (8) He says: "Not only do American children as a class fail to gain either knowledge or power through the traditional curriculum—they spend an inordinately long time in failing. The period spent in school and college before students begin professional studies is longer in the United States than in any other western country. An economy of two or three years is urgently necessary." At the same time professional schools are becoming more and more highly specialized and there are those in Engineering Schools, for example, who recommend entrance at nineteen, giving a boy opportunity to do practical work after graduation from high school in order to determine his interests and qualifications.

The courses of instruction as announced for special classes of bright children do not indicate any readjustment in Mathematics. Superintendent Condon announces the following curriculum for the "Special Academic Class" to be organized in the Lafayette Bloom Junior High School, Cincinnati in September, 1917:

<i>Subject</i>	<i>Hours</i>
Physical Training and Hygiene	5
Latin or First-year German	5
General Science	5

Mathematics	5
English	5
Music	$\frac{1}{2}$
Penmanship	$\frac{1}{2}$
Drawing	2
Household arts (girls)	
Industrial arts (boys)	2
Total	30

In the McKinley Preparatory School, Lincoln, the course of study is the same as in the regular seventh and eighth grades except that music and art are omitted and the addition of one year of high school work is done during the two years in preparatory. In the special class for bright pupils, Washington, D. C., the instruction in mathematics "does not vary at all from that given in ordinary class work." In the Thirkell School, Detroit, the "advanced class" does the regular seventh and eighth grade arithmetic and in addition one semester's work in Algebra with a good start on the next, in two years.

The growing dissatisfaction with the present curriculum in mathematics and the widening movement for reorganization of subject matter and psychologizing the presentation are factors that should result in special application to the interests and needs of the child of exceptional mathematical ability. Since 1903 the University High School, Chicago, has been developing a solution of the problem of reorganization of mathematics along lines of correlation. The course of study is outlined in detail by E. R. Breslich and others in *School Review* (Nov., 1916). "In three years the student has accomplished the work usually given in three and one-half years, due mainly to the correlation of the various subjects of mathematics, to the reorganization of material usually taught during the first three years, and to the training obtained through supervised study." The pupil, gifted in mathematics, seems well provided for in this high school course which, in the third year, lays the emphasis mainly on algebra and trigonometry and in the fourth year offers a semester of college algebra supplemented by reading and reports. It is significant that the outside preparation expected of the students is an average of fifteen minutes a day, the first year, thirty minutes for the second year, and thirty-five minutes a day for the third and fourth years. An average of fifteen minutes of the one hour class period is devoted to supervised study. The courses are uniformly five class periods a week.

The following extracts from periodicals indicate along what line pioneers in teaching classes of gifted children may revise

the instruction in mathematics and yet be in harmony with educational movements:

"It is evident from this report that the impression is entertained in many quarters that the arithmetic as now taught in the seventh and eighth grades is not satisfactory. Clearly implied also is the position that the introduction of higher mathematics will encounter some difficulty and that the subject matter of algebra and geometry must be largely reorganized before it can be used in the lower schools. . . . It may be predicted with great assurance that in the long run geometry will be found to be a very practical and stimulating subject for students of the Junior High School age. Such a modification of the mathematics course as would follow the introduction of geometry in this intermediate school would serve large intellectual and social purposes." (7)

"Elementary school courses are ejecting extraneous material thus placing emphasis on minimum fundamental essentials of Arithmetic. Assuming that the primary grades by means of informal games and other familiar devices inculcate fundamental number combinations, the fundamental essentials of Arithmetic may be thoroughly taught in four or at most five years. The facts submitted by certain schools no longer permit us to regard this as an experiment." (15)

"For the present we should devote our best efforts to the organization of a course—very flexible and very alluring—in general science for youths from twelve to fifteen years of age. One hopes that a similar course in mathematics could be worked out but with the traditions of that subject crystallized as they now are, the situation seems hopeless. Certainly from the point of view of any sound theory of liberal education the thing is possible and most highly desirable." (18)

"To a very considerable degree general mathematics will be found to facilitate the educational movement to provide for individual differences in ability and rate of progress. . . . An important movement is epitomized by the advent of the junior high school which is going to force the adoption of general or union mathematics. . . . General mathematics is in harmony with the attempt to organize a course of instruction which shall be properly graduated and progressive from year to year with close regard to maturing abilities of pupils." (13)

Twenty-two university and high school instructors in mathematics answered the following question in April, 1917:

Given a class of exceptionally bright students, and with no consideration for the practical difficulties involved, would you cover the ground in less time or enrich the course? The work

might be arranged by terms for sections of superior ability and by semesters for classes of less ability.

Course	No. who advocate completing in less time	No. who advocate enriching the the course
Elementary algebra..... $1\frac{1}{2}$ units.....	7	15
Plane geometry.....1 unit.....	10	12
Solid geometry..... $\frac{1}{2}$ unit.....	10	12
Trigonometry..... $\frac{1}{2}$ unit.....	8	12
Plane analytic geometry...3 semester hrs.	4	14

It will be seen that there is no uniformity of opinion to guide the reformer who is revising courses in mathematics for bright pupils. One university professor believes that the college entrance requirement is sufficient preparation for more advanced work and therefore there is no need to enrich the courses if they are thoroughly mastered. Another professor believes that bright pupils would profit by the addition of a large number of problems and exercises and therefore he does not advocate completing the course in less time. Both professors have sons who are gifted in mathematics and are completing their secondary education at an age younger than the average.

With the revision of subject matter must come also training of teachers, especially of those engaged in secondary mathematics, which has been called the most serious mathematical problem in America to-day.(11) In the mathematical survey of the Chicago school system in the spring of 1914 the committee reported more favorably on the teaching of arithmetic in the elementary schools, than on the teaching of mathematics in the high schools.(19) The preparation of mathematics teachers of various grades was to have been the main topic of discussion at the conference of the "International Committee on the Teaching of Mathematics" to have been held in Munich, Germany, August, 1915. Dr. Flexner points out clearly the present failure in Mathematical instruction:

"In examinations held by the College Entrance Board in 1915, 69.7% of those examined in algebra from quadratics on failed to make as much as 60%; 42.4% failed to make 60% in plane geometry. What would the record be if all who studied these subjects were thus examined by an impartial outside body? . . . It is therefore useless to inquire whether a knowledge of Mathematics is valuable, because pupils do not get it; and it is equally beside the mark to ask whether the effort to obtain this knowledge is a valuable discipline, since failure is so widespread that the only

habits acquired through failing to learn Latin or algebra are habits of slipshod work, of guessing and of mechanical applications of formulas, not themselves understood.(8) Mr. E. R. Breslick also recognizes the present need of reform. "The failures in mathematics as recorded show a very much higher percentage than in most of the other subjects of the curriculum. . . . We must admit on the basis of scientific studies that it is extraordinarily difficult, even for good teachers, to keep mathematics in the high school at the same level of success as the other subjects that are taught."(3)

While it is generally recognized that there must be specially trained teachers for classes of backward and delinquent children, yet the exceptionally bright child has received only incidental and usually very haphazard attention. The organization of mathematics clubs such as those in Marion, Ohio(9) and in Hyde Park High School, Chicago,(17) offers one solution of the problem "What shall we do for the bright students?" The University High School, Chicago, has endeavored to make provision for students gifted in mathematics by its organization of mathematics contests,(16) its generous mathematical equipment, (20) and by proper library direction of supplementary reading. These various devices may constitute a part of the larger technique that needs to be developed to direct in the most efficient way the enthusiasm and the energy of the fast worker in mathematics.

Only seven of the twenty-three cities listed in answer to the first questionnaire report special teachers of Arithmetic in connection with departmental work, Cincinnati having 25 and New Orleans 60. The only supervisor of arithmetic is reported by East Cleveland, Ohio, where Superintendent Kirk finds a supervisor necessary in order to train teachers in the Speer method of teaching Arithmetic. The reorganization of subject matter with the introduction of new methods and text-books(10) urges the necessity for a more universal introduction of departmental work with teachers specially trained in mathematics. The need of a supervisor is more apparent during our present experimental stage of mathematical reform than it has been in the past. While the grouping of students in slow, average, and bright sections promises to meet some of the difficulties which confront mathematical instructors, other problems are introduced for which the co-operation with a supervisor would be invaluable.

Much experimental work is being done in establishing standards in arithmetic and incidentally the bright child is profiting by this growing emphasis on the individual training which the use of all standard tests accomplishes.(12). Tests in stand-

ardization are also being applied to the teaching of algebra and a definitely worked out experimental plan has been published by H. O. Rugg of the School of Education of Chicago.(14) Standards designed for non-homogeneous groups of children will require revision to be most effective when applied to slow, average and bright sections.

One of the most important phases of experimental work is that of standardizing tests for the measurement of general intelligence. The teachers of the "advanced class" in Thirkell School, Detroit, regard the selection of the children as one of their most difficult problems and one in which they have not been altogether successful. Mr. S. T. Courtis is revising tests for the selection of these pupils of superior ability.

In conclusion it is seen that a course in mathematics for students of superior ability must be harmonized with present educational reforms. It must be built up as part of a carefully constructed scheme which is yet to be evolved with the scientific help of the experimental educator. Before courses can be planned satisfactorily for the gifted child in mathematics or in any other subject, the following problems must be solved:

1. Revision of tests for measuring general intelligence.
2. Determination of the time required for the elementary and secondary education of the gifted child, involving either an enrichment or acceleration of the present school course.(2)
3. Determination of the earliest grade in which the gifted child will profit by grouping.
4. Size of class most advantageous for the individual child.
5. Amount of drill necessary for superior students.
6. Standards for superior students.
7. New texts in the elementary and secondary schools.
8. Teachers trained in new technique.

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BOOK NOTES

The essentials of child study, including class outlines, brief discussions, topical references and a complete bibliography. By G. W. A. LUCKEY. Chicago, University Publishing Company, 1917. 219 p.

This work is dedicated to the children, and is the outgrowth of twenty-one years of experience in teaching the subject in the University of Nebraska. It represents the nucleus of a three-hour college course for one semester of eighteen weeks, fifty-two periods of fifty minutes each. It is used as a text in a beginning course in child study. The bibliography is confined almost entirely to references in English. It should be helpful also to teachers and parents. Among the thirty-three chapters are, The Beginning and Scope of Child Study and Its Importance, Birth, The Physical Child, including Health, Growth, Nervous System, Senses, each of which is given a chapter; Feelings, to which four chapters are devoted; and then comes Knowing, with an outline of the psychology of the intellect and the functions of memory, intelligence, judgment, types of children's drawings, language, laughter, order of interest in literature, methods of study, fatigue, and finally, moral and religious training and the music sense of children. One very important feature of the book is the many pages of quotations from various authors. The work is practical and should be in the hands of every thoughtful teacher. Much of it is more or less schematic. It would be very easy to criticize such a book. Of its very nature it cannot be complete, for the subject is far too vast. We should have been glad, for instance, to have a little historical perspective, but of this the author gives us nothing. It is another subject. We should have thought that even according to this plan of the book more attention should be given to the development of language, while in fact we have barely three pages of the text, but the references are copious. The merits of such a book depend entirely upon the author's sense of perspective and here Professor Luckey has shown remarkably good judgment. The book, too, is timely, and ought to do very much to give child study the place it deserves, but often lacks. The real importance of the Nebraska work will only be seen in its proper proportions from the viewpoint of the future historian in this field.

The dynamic of manhood. By LUTHER H. GULICK. New York, Association Press, 1917. 117 p.

The original text of this book has been submitted to specialists in various fields, and to these the author acknowledges his indebtedness. The book assumes that the two major motives are two heart-hungers, first, to benefit self, second, to benefit others. The hunger for a friend leads him to discuss loneliness, loyalty, the effects of friendship and the discovery and transmission of character. The hunger for woman, which begins in "spooning," is a great factor in the development of the feelings, and he discusses monogamy, autoerethism, early marriage, etc. The chapter on hunger for children dwells upon the differences between the father and the mother, the right to be born and well born, and the characteristics of a good father. The hunger for God is directed to nature and its origin; the book closes with the author's conception of a living, personal God.

The play movement and its significance. By HENRY S. CURTIS. New York, Macmillan Company, 1917. 346 p.

This volume is the fourth in the author's series and its aim is to give a concrete picture of the extent of the development of play in this country, of the sources from which the movement has sprung, and the direction in which it is going. One of the most interesting chapters is on play at the school, which has taken many different forms. The municipal playground movement is treated concretely, with special descriptions of playgrounds at Chicago, Philadelphia, Oakland and other cities. Public recreation is another large theme. The chapter on Other Places to Play, what is done in vacant lots, on roofs, in apartment houses, on promenades, streets, etc., is interesting. Then follow chapters on Play for Institutions, Play in the Country, Equipment and Supplies, which gives practical information of great value. The chapters on the Boy Scouts and the Camp Fire Girls are a little more perfunctory, as they have been described elsewhere. The chapter on The Recreation Survey is very properly followed by one on What Is the Cost?

An introduction to high school teaching. By STEPHEN SHELDON COLVIN. New York, Macmillan Co., 1917. 451 p.

This work is designed to give practical help to those in our colleges and universities soon to enter the work of high school teaching. It emphasizes particularly the general methods of instruction as they apply to high school. It deals little with organization or administration. It assumes that all instruction should be definite, with a wealth of illustration and practical illustrations. A select bibliography at the end is of great aid, while the appendix has a detailed outline. The author first treats the Outline, Scope, then the High School Pupil, Teacher, Question of Discipline and Indirect and Direct Control, The Function of Punishment, Eliminating Waste from the Class Room, the Methods of the Class Period, Teaching Knowledge of the Pupil, Nature and Function of Drill, Its Educational Methods, Acquiring New Knowledge through Oral and Book Instruction, through Illustration and Demonstration, Other New Knowledge and the Stimulation of Thought, by Inductive and Deductive Development, the Question Lesson Plan, and Supervised Study.

Self-surveys by colleges and universities. By WILLIAM H. ALLEN. Yonkers-on-Hudson, World Book Company, 1917. 394 p.

This country, we are told, spends half a billion dollars yearly on higher education to shape democracy's ends, and this volume attempts to tell institutions how they can increase their own efficiency and make our 600 colleges and 400,000 students more helpful to the highest development of the country. Accordingly, the author first gives a brief account of the survey moment in higher education; then follows the procedure for a cooperative college survey; the relations of trustees to president and faculty; executive and business efficiency; faculty government; extra-curricular activities of students; course of study; instructional efficiency; relation of college communities. This book, like its companion above, is copiously illustrated, and contains such a vast body of helpful information that it should be in the hands of every college administrator.

Self-surveys by teacher-training schools. By WILLIAM H. ALLEN AND CARROLL G. PEARSE. Yonkers-on-Hudson, World Book Company, 1917. 207 p.

This book is written on the assumption that no enterprise in this country is so important to its future welfare as teacher-training, and that this is the great need. Hence the authors first proceed to analyze the problem and present conditions. There is first the reason for self-surveys; then an account of pathfinding by Wisconsin's normal schools; this is followed by chapters on Steps in Making a Self-Survey, Administration Problems, Course-of-Study Problems, Supervision Problems, Instruction in the Academic Department, Training Department's Training, Extra-Curricular Activities of Students, Technique of Reporting Surveys, General Needs of Teacher-Training Schools, and Exhibits. The book is the most interesting and competent in its field and is enlivened by many photographic and other illustrations.

A survey of a public school system. By HENRY LESTER SMITH. New York, Teachers College, 1917. 304 p.

There is first a preliminary discussion of the community and the plan of a school survey; then normal progress, retardation and acceleration. The third chapter takes up the census, enrolment, promotion, failures, withdrawals and repetitions; then follow chapters upon finances, course of study, achievements of pupils, teachers, supervision of instruction, school buildings, recommendations, and criticisms of the Bloomington school survey.

Practical child training. Book I, Early Lessons for teaching obedience in the home. By RAY C. BEERY. Pleasant Hill, Ohio, International Academy of Discipline. 294 p.

This is not a collection of observations but seeks to show parents just how to develop certain desirable traits in children. It is a parents' manual and the course is comprised in four volumes, this being the first. The introductory chapter explains the five most important principles upon which the system rests. Then follow detailed lessons in teaching obedience from infancy to mature life. Parents must actually teach these lessons to their children. Book II contains early lessons in self-control; Book III is on the training of the body; Book IV, early lessons in morality. Together they cover most of the points of discipline which from time immemorial have troubled anxious parents. A story is often used as an illustration. The work is illustrated by several full-page photographs. The book instructions are supplemented by a correspondence department.

The progressive music series. Books one, two, three and four; teacher's manual, volumes one, two and three. Boston, Silver, Burdett and Co., (c. 1916, 1917).

The teaching of music has long been in a bad way. It was established in the schools of this country by men who were very mechanically-minded in music and at the same time obsessed by the idea of progressive logical stages. Few topics have been taught with less reference to the nature and needs of the child, on the one hand, or to the rich musical material to which he should be introduced on the other. In this formidably ponderous series of four big and three small volumes, we have a really epoch-making step taken towards better conditions. In the first place, the authors of this series realize that the child must sing and have quite a repertory of songs it knows by heart before it can profit much by learning to read music, whereas the old

idea was simply to begin with the staff. Again, the songs selected here are for the most part good and fit the needs and interests of the child. They are not selected, made or modified primarily with reference to logical gradation. The first three volumes of the large four apparently contain nothing but directions to teachers and the accompaniments, one by one, of the songs in the little books, which go from the second to the seventh grades, inclusive. These three volumes are teacher's manuals, in the first half of which we have a three-fold distinction which runs through everything, between the sensory, the associative and the adolescent period, and voluminous suggestions concerning appreciation, voice-culture, sight-reading, interpretation, conduct of musical recitation, with various graded outlines on tone, time, theory, etc. for different grades, while the third part is made up of nineteen chapters on such things as the quarter-note, beat, interval studies, simple song forms, etc. There are plenty of instructions for each month from the beginning, discussion of motifs and figures, the rhythmic sense, musical vocabulary, etc., with a glossary. Book Four starts in with music reading for adolescents and a lot of new songs. The editors of this series have even dared to select a few wordless dances, the number of which should have been greatly increased.

When the Heart of Oak series of school readers came out, the writer of this review thought it marked an important stage, because it stressed the kind of literature to be taught to children as no other series had ever begun to do. The same is true of this series. The kind of music it offers to the child is properly stressed and is the best of any series yet made accessible to children. Thus it marks a distinct and most wholesome epoch in musical pedagogy. To our thinking, however, there still remain two faults. First, the compositions of the editors themselves are far too prominent in number. This might be excusable for younger children, where there is less music to select from, but although some of these compositions are very good, those presented to the older children do not begin to compare with the best selections that might be made from the vast field of music so that we still have the trail of what has seemed in previous American music-books the ineffable conceit that music teachers themselves can vie with the great masters in composing things fit for children. The fact that the quality of these compositions is better than most of those written by the editors or contributors to series does not excuse the disproportionate number of these new creations. The other mistake of the books is due to the publishers' interests or instinct for padding. If ordinary intelligence and a little rudimentary training could be assumed for the teachers, the first three volumes of the larger books might be entirely omitted or vastly condensed.

Apprenticeship and apprenticeship education in colonial New England and New York. By ROBERT FRANCIS SEYBOLT. New York, Teachers College, 1917. 121 p.

This survey begins with the system in England, its transfer to New Plymouth, Massachusetts Bay Colonies, and its extension to Connecticut and New York. It is quite plain that the essential systems of the English practice were reproduced in colonial New England and New York, and elementary education could not satisfy the needs of the colonies; but it is significant that the legislative provisions are so many of them found in the poor laws. This system took care of the entire problem of public elementary education during the colonial period, for by these laws the scope of apprenticeship was vastly broadened.

The Lancasterian system of instruction in the schools of New York City. By JOHN FRANKLIN REIGART. New York, Teachers College, 1916. 105 p.

This is a very interesting monograph on an important topic. The survey begins with the school in New York in 1805 and the Free School Society. The author also describes the origin of the system, Sidney Smith's impression of it, the great lack of schools for the poor in that day, methods of teaching the various topics, including morals, training of teachers, etc. Perhaps the most original contribution is the story of the system in New York.

Negro education; a study of the private and higher schools for colored people in the United States. Prepared in cooperation with the Phelps-Stokes Fund under the direction of Thomas Jesse Jones, specialist in the education of racial groups, Bureau of Education. Washington, Government printing office, 1917. 2 v.

These very comprehensive folio volumes give us a broad survey of the entire problem. Under "General Survey" the author treats the elements of race development; financial support of negro students; type and grade of education, etc. Then follow chapters on the facilities, attendance, buildings, pupils, teachers, terms, high schools; under "Secondary Education," come college and professional courses, training of teachers, industrial and race education. Ownership and control, funds and associations, financial accounts, student records, buildings and grounds, history of negro education, are all treated *in extenso* in the first volume. The second volume gives a summary of educational facilities in different states. The work is illustrated by forty cuts and thirty maps and diagrams.

The city superintendent and the board of education. By WILLIAM WALTER THEISEN. New York, Teachers College, 1917. 137 p.

Under the caption, "The Board and Its Duties," the author treats the question of legal limitations and the work of board committees. Under "Administrative Organization," after justifying the need of a treatment, he discusses types and also administrative organization in other fields. The final theme is authority given the chief executive in matters of instruction and of business.

Standardized reasoning tests in arithmetic and how to utilize them.

By CLIFF W. STONE. New York, Teachers College, 1916. .24 p.

This book discusses conditions and directions for using these tests; more fully, directions for scoring; and most fully, representing, interpreting and utilizing scores.

Educational sociology; a digest and syllabus. Part I: Introduction. Part II: Applications to curricula and studies. By DAVID SNEDDEN. New York, Teachers College, 1917. 2 v.

The author here gives us a very interesting and full digest and syllabus of his course of study, which is very comprehensive and must be of high value.

Teacher training agencies. By THOMAS E. FINEGAN. (Volume 2 of the 11th annual report of the State Department of Education.) Albany, University of the State of New York, 1917. 439 p.

This is an historical record of the various agencies of the State of New York employed in training and preparing teachers for the public

schools of the state. There are many illustrations of men, buildings, graduate classes, etc., and it is very interesting to see the faces of past and present leaders with whose names one has long been familiar, as well as of many who are unknown outside their own circle. The work, in fact, is a veritable picture and portrait gallery.

An introduction to special school work. By MARION F. BRIDIE. New York, Longmans, Green and Co., n. d. 238 p.

The most important chapters in this work are those entitled Preparatory Class, Sense Training, Reading, Oral Lessons, A Manual Oral Class, Number Work, Physical Training, Junior Manual Training, Vocational Training for Boys and Girls, and School Organization.

Proceedings of the fifty-second convocation of the University of the State of New York, Albany, New York, October 19 and 20, 1916. University of the State of New York, 1916. 222 p.

The chief themes treated at this session were the Written Word (four papers), the Printed Word, American Speech, and the Junior High School.

Standards in English. By JOHN J. MAHONEY. Yonkers-on-Hudson, World Book Company, 1917. 198 p.

This book first outlines a course of language by grades, from the first to the eighth, inclusive. We then have a literature outline, while the appendix contains a picture list, common errors, their correction, model letter-forms, and the allotment in language.

Annual report of the Rockefeller Foundation, 1916. New York, Rockefeller Foundation. 458 p.

This is an official report of the directors of the different departments of the Rockefeller Foundation, which presents in a very impressive way the varied activities of this unique institution.

The mythology of all races. Ed. by Louis Herbert Gray. Volume VI, *Indian*, by A. BERRIEDALE KEITH. *Iranian*, by ALBERT J. CARNOY. Boston, Marshall Jones Company, 1917. 404 p.

The first 253 pages of this book are devoted to the Indian and the remainder of the volume to the Iranian mythologies. The first has chapters on 1. Gods of Sky and Air; 2. Of Earth, Demons, and Dead; 3. The Mythology of the Brāhmanas; 4. The Great Gods of the Epic; 5. The Minor Epic Deities and the Dead; 6. Mythology of the Purānas; 7. Buddhist Mythology in India and Thibet; 8. The Jains; 9. Mythology of Modern Hinduism. The Iranian chapters treat of 1. Wars of Gods and Demons; 2. Myths of Creation; 3. The Primeval Heroes; 4. Legends of Yima; 5. Traditions of the Kings and Zoroaster; 6. The Life to Come. There are several dozen illustrations of various kinds, many colored, which give added interest to the volume. The writers of both these mythologies are men of competence, and they have brought together much interesting and well-chosen material. One cannot, however, escape the suggestion that the work on Indian mythology is so much more important and interesting than the Iranian, that most people would have preferred more relative space given to the former.

Health charts. Proposed by the joint committee on Health Problems in Education of the National Council of the National Education Association and the Council on Health and Public Instruction of the American Medical Association. Prepared by Dr. Thomas D. Wood. New York, 1917.

This is an excellent collection of all kinds of diagrams, pictures, mottoes, curves and schedules, bearing upon health, many of which ought to be in every school, although they seem to the reviewer to have very different degrees of merit.

Health essentials for rural school children. Proposed by the joint committee on Health Problems in Education of the National Council of the National Education Association and the Council on Health and Public Instruction of the American Medical Association. Prepared by Dr. Thomas D. Wood. New York, 1917. 23 p.

Annual report of the Surgeon General of the Public Health Service of the United States for the fiscal year 1916. Washington, Government Print. Office, 1916. 421 p.

Department of the Interior, Bureau of Education. Lessons in community and national life. Community leaflet, Nos. 1-3. Lesson A-1. Some fundamental aspects of social organization. Lesson B-1. The effect of war on commerce in nitrate. Lesson C-1. The war and aeroplanes.

The curriculum of the Horace Mann elementary school. By the Teachers of the Horace Mann elementary school. New York, Teachers College, 1917. 138 p.

Current practice in city school administration. By W. S. DEFFENBAUGH. (Bulletin, 1917, No. 8). Washington, Government Print. Office, 1917. 98 p.

Demand for vocational education in the countries at war. By ANNA TOLMAN SMITH. (Bulletin, 1917, No. 36). Washington, Government Print. Office, 1917. 16 p.

Teachers College bulletins. Published by Teachers College, New York, 1917. (Technical Education Bulletins, Nos. 30-34.)

Economical diet and cookery in time of emergency. By MARY SWARTZ ROSE, CORA MARGUERITE WINCHELL and BERTHA E. SHAPLEIGH. 8 p.

Simple lessons on the physical care of the baby. By JOSEPHINE HEMENWAY KENYON. 19 p.

Lessons in home nursing. By ISABEL M. STEWART. 8 p.

How to plan meals in war time. By MARY SWARTZ ROSE. 15 p.

Ninety tested palatable and economical recipes. Compiled and tested by department of foods and cookery, Teachers College. 26 p.

My ideal of marriage. By CHRISTIAN D. LARSON. New York, T. Y. Crowell Co., (c. 1916). 109 p.

The woman who wouldn't. By ROSE PASTOR STOKES. New York, G. P. Putnam's Sons, 1916. 183 p.

Report of the conference on new ideals in education, held at Oxford, from July 29 to August 5, 1916. Published by the Secretary, 24 Royal Avenue, Chelsea. 267 p.

Recent books on the Kaiser.

The real Kaiser; an illuminating study. Anonymous. New York, Dodd, Mead and Co., 1914. 230 p.

The German Emperor as shown in his public utterances. By CHRISTIAN GAUSS. New York, Charles Scribner's Sons, 1915. 329 p.

The psychology of the Kaiser. By MORTON PRINCE. London, T. Fisher Unwin, 1915. 75 p.

Is the Kaiser Insane? A study of the great outlaw. By ARNOLD WHITE. London, C. Arthur Pearson Ltd., 1915. 160 p.

Builder and blunderer; a study of Emperor William's character and foreign policy. By GEORGE SAUNDERS. New York, E. P. Dutton and Co., 1914. 205 p.

Stories of the Kaiser and his ancestors. By CLARE JERROLD. London, Stanley Paul and Co., 1915. 194 p.

William the second, as seen in contemporary documents and judged on evidence of his own speeches. By S. C. HAMMER. London, William Heinemann, 1917. 272 p.

An emperor's madness or national aberration? By ERNESTO LUGARO. Translated by U. N. Robinson. New York, Dutton, 1916. 135 p.

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G. STANLEY HALL, Ph. D., LL. D.

President of Clark University, and Professor of Psychology and Education

WITH THE ASSISTANCE OF

WILLIAM H. BURNHAM, Ph. D.

Professor of Pedagogy, Clark University

AND WITH THE CO-OPERATION OF

F. W. ATKINSON, President Polytechnic Institute of Brooklyn; T. M. BALLIET, Dean
of the School of Pedagogy, New York University; Professor EARL BARNES,
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